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THE TELEVISION MAN

The Story of
John L. Baird



John Rowland

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The Television Man

The Story of John L. Baird

by John Rowland

John Baird's career with pictures started when he was a boy near Glasgow, Scotland, and photography became the schoolboy fad of the times. But many diverse pursuits intervened. He was an inventor *first*, and full of schemes.

His experiments and inventions included a diamond-making machine, the Baird Under-socks that kept feet warm in winter, cool in summer. He went to the West Indies, made and exported jam and chutney, bought and merchandised "Baird's Speedy Cleaner" soap, and used balloons in oversize boots for pneumatic soles, and more comfortable walking.

Always afflicted by poor health, he returned to Hastings, and to Fairlight Glen, a well-known health and beauty spot. There, in 1923, he began experimenting with a small cell called selenium, which would transmit electricity. He found that light could be converted into electricity and vice versa.

That evening he told a friend he had found a way to transmit pictures by wireless. He fixed a fantastic apparatus in his bedroom with a tea-chest, a hat box, glue, knitting needles, a big lens, electric batteries and wireless valves. On the washstand in his bathroom he eventually had the first television set, though it had not yet got the name.

He soon had rivals. An American company (Bell Telephone Laboratories) was putting on exhibitions in the United States. These started in April, 1927, a year after Baird gave his demonstration to the members of the Royal Institution. During the period from 1929 to 1931, he began producing tiny-screen colored television pictures. He had also turned his attention to a really massive big screen.

The outbreak of the Second World War put a stop to all public television, but Mr. Baird continued to experiment privately with the development of color.

This is the exciting story of one of the most remarkable inventors of the 20th century, whose discoveries have given pleasure to millions.

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THE
TELEVISION MAN

The Story of John Logie Baird

JOHN ROWLAND

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Dedicated
to the memory
of
Gee

who saw it planned, but did not see it written

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CHAPTER ONE

SON OF THE MANSE

THE year was 1888. The place was the little seaside town of Helensburgh, not very far from Glasgow. One of the ministers in that town was the Rev. John Baird, who lived in a big stone house called The Lodge.

At the Lodge was born in that year a baby called John Logie Baird, whose strange career this book describes. The world into which he came was a world very different from that in which we live today. His great claim to fame is the fact that he was a pioneer of television; but when he was a boy there was, of course, no television. Nor was there radio, and even a modern convenience like the telephone was something very rare, used only by business firms or very rich people who could afford it. Baird himself, in some thoughts about his young days which he jotted down when he was much older, recalled that he saw his first motor-car when he was about eight years old. It was a queer-looking affair, with huge wood wheels; and it made a rare clatter as it drove over the hard, uneven roads of old Scotland.

John Baird seemed to most of his friends in those early days quite an ordinary little boy. His greatest friend was the son of a gardener who lived next door, a boy called Willie Brown. By the time the boys were three or four years old, they had become bosom friends, going everywhere together and sharing the games that all little boys played in those days

when toys were simple, and were, in any case, few and far between.

The large garden of Mr. Baird's house was their favourite place to play. They used sometimes to annoy their parents by coming in smothered with black mud, when they had been building mud houses in some more or less neglected part of the garden.

There was, little in those days to show that John Logie Baird was destined to become a great inventor.

There were, however, indications that he was a boy, even when quite young, who had a very vivid imagination. On Sundays, when he was very small, he was often left at home, while his father and mother (formerly a Miss Jessie Inglis) and his two sisters, who were older than he, went off to Church. Unlike some ministers, his father did not believe in making the children come to church until they were old enough to have some idea of what was going on at the service. And on one Sunday morning, when he was alone in the big house, John looked out of the front window, down the street.

A very old man, leaning on a stick and bent with rheumatism, came into sight. He tottered along the street, and then stopped outside the house and looked up at the window out of which the boy was peering. The house was absolutely quiet, and the boy could only just look over the window-sill. And suddenly there came into his mind an idea which would have occurred to few little boys. He thought that the poor old man who was looking up at the window was himself! He imagined that he was having a kind of preview of himself as he might be in the years ahead, when he had grown a lot older.

This was a terrifying thought—the idea that he might one day become old and crippled like that scared him. He left his

place by the window and ran back into the house. When his father and mother came back from church he tried to explain to them what had worried him; but they did not really understand.

It was not long after this that John went to school. His first school was a very odd place, kept by a man called Porteous, whose idea of how to run a school was to march about from one classroom to another carrying a cane. The cane was not just for show, either; he was prepared to use it at any time on any of the pupils who showed signs of being unruly! But John Baird was not much worried by this, as he was one of the smallest and youngest boys in the school and was not taught by the headmaster.

He was also not likely to attract the attention of the headmaster and his cane, for he was a fairly docile little boy; and he was very much interested in learning to read and write, which he appeared to do without much difficulty.

But John Logie Baird, though he had been quite a healthy baby, was not a very strong little boy. When he was only two he had had a serious illness; and years afterwards he said that his first memory of his childhood was of lying on a red blanket under an apple-tree in the garden. This was when he was recovering. And as we shall see, he was often in bad health when he was grown-up. This may have been a result of this very serious illness when he was only two years old.

One peculiarity of the Rev. John Baird made John's school-days a little difficult. His father had a theory that the best time to be out walking and getting exercise was between eleven o'clock in the morning and three o'clock in the afternoon. So he used to leave the house at eleven and walk for three hours every day. There was probably a good deal of sense in this, especially in Scotland where the evenings were liable to be damp or cold. But it made things difficult in the

home, as Mr. Baird did not have his main meal until three o'clock. And the children, of course, had to have their dinner much earlier, in order to get back for afternoon school.

Just what Mrs. Baird thought of all this we do not know. But she had to cook two meals each day—for the children at one o'clock, and for herself and her husband at three o'clock.

John Baird said that his father was a fine man—he was a tall and impressive-looking figure with a big black beard. He was not, like some fathers nowadays, easy to approach. In those days, of course, fathers were often rather aloof, distant people, and their children felt almost terrified of them.

Indeed, the Baird family seem to have in some ways rather odd, and some of this oddity was to come out in John Baird when he got older. The oddest of his relatives were his aunts. Aunt Eliza married a wealthy Australian, and spent a lot of his money at auction sales, where she would buy almost anything that took her fancy. When she died, some years later, her house was crammed from roof to cellar with second-hand furniture, china and glass, which she had accumulated from the many sales which she attended. Another aunt, whom Baird loved as a child, had countless cats, dogs, and fowls. There was one hen called Lizzie, who slept every night on his aunt's bed!

With all this family peculiarity, Mr. Baird did not rise to any high position in the church, though he was admired by the members of his congregation. One of these, indeed—a young man called Bonar Law—was later to be the British Prime Minister, though no one suspected it in those days.

These things made John Baird's home life entertaining enough, though he was not very happy at school. He had managed to dodge Mr. Porteous' cane for a time; but Mr. Porteous, whatever his merits as a teacher, does not seem to

have been much of a businessman. For, when John had been at his school for a year or two, Mr. Porteous went bankrupt, and the school closed down. The question was: where should John be sent now? There was much discussion between his father and mother, and in the end he went to another school, where he spent several very unhappy years. This school was kept by a lady called Miss Johnston, who used the cane as much as Mr. Porteous; and here John Baird, a little older and perhaps a little more mischievous, was not able to avoid punishment.

When he was many years older he wrote that his years at Miss Johnston's school were among the most unhappy of his life. No description of the lady is available, except that she was considered a very formidable person who ruled her school rigidly.

Though the Rev. John Baird was an enlightened man in his church outlook, young John's ideas of religion sometimes made him unhappy. He records that he used to think of God as floating somewhere overhead. God to him in those days was an old man with a long beard, something like his father, but far more powerful and far more to be feared. He acquired from somewhere, too, a fear of ghosts. And when he was put to bed at eight o'clock, he would pull the blankets over his head, and lie there in terror, thinking that a grey lady or a horrifying old man was going to creep up on him. "A burglar or tiger would have been a welcome intrusion," he said.

It is unusual for a boy to be so full of fears when very young. It took John Baird a long time to get rid of these fantastic ideas. It was not until he was nearly twenty that he grew out of this frame of mind, and became a happier and more sensible person.

Sometimes, too, his mother would take him visiting some

of the poorer members of his father's congregation. This was especially trying for him, when they were elderly and ill. Mr. and Mrs. Baird were very kind people, and they wanted to do all that they could to help those who were in sad circumstances, as many people were in those far-off days when there were no Old Age pensions and no National Assistance. There was one old lady in particular, to whom Mrs. Baird took food almost every day.

It is, indeed, not altogether surprising that Baird had an unhappy childhood. Things did not improve very much when he was taken away from Miss Johnston's little school and sent to a bigger school in Helensburgh. This was run by three public-school men who had been to Oxford or Cambridge. When he was grown-up and looking back at this school, Baird said that it was a bad imitation of Eton or Harrow.

He was never much of a sportsman, and sport was the centre of the life of his new school.

He took special exception to the rule that when a game of football was over, all the players had to strip and stand under a cold shower. Scotland can be very cold in the winter, and Baird said that that became an almost unbearable ordeal for him. It may, indeed, have been this rather unreasonable rule that increased his tendency to bad colds and chills which lasted all through his life.

He always tried to dodge this cold shower. He would sneak quietly into the dressing-room, take off his football gear and start putting on his ordinary clothes. Then, just as he was putting on his jacket or buttoning up his shirt, the booming voice of a master would come.

"Baird, you have not had your tub!"

Then he would have to undress all over again and take his place under the icy-cold shower, feeling worse than ever

because he had been wearing warm clothes, even if only for a minute or two.

The school was not very comprehensive in what it taught, either. The emphasis all the time was on Latin and the classics, which bored young John Baird. There was no science teaching, and only very little in the way of mathematics.

Soon, however, there came something which enabled Baird to start using his brains in something like the way which came naturally to him. Most schools are swept, from time to time, by a craze of one sort or another. And the craze which hit this school was the craze for photography. Every boy who could scrape together enough money, bought a camera; and they took pictures of the town and its surroundings, of their parents, and of each other.

Baird saved every penny he could. He wrote to all his relatives, telling them he wanted a camera and asking if they would contribute towards its cost. In the end he managed to buy a wonderful camera—far better than those owned by most of the boys. As a result of this he was elected President of the Photographic Society of the school. This society took itself very seriously. It held regular meetings where pictures were shown and discussed, and sometimes one of the boys read a paper or gave a lecture on some aspect of photography.

Baird, of course, had no knowledge then that one day his whole life would be devoted to what was, in a sense, a kind of photography; but he found the work of the Photographic Society of far greater interest than anything else that went on in the school. The meetings were held out of school hours. Baird used to sit in his seat at a Latin lesson, taking no interest at all in what the master was saying, longing for the lesson to end, so that he could devote his attention to his beloved camera.

This Photographic Society seemed likely to give Baird

just the outlet that was needed for his inventive mind. But unfortunately the whole thing came to an end—and for a slightly comic reason.

At one of the meetings of the Society one of the members came in, in a state of great anger. He had, he said, been insulted. This member had been out in the street with another boy (called Sonny Forbes). He had been showing Sonny how best to climb up a lamp-post, he said. Then Mr. Forbes, Sonny's father, had come along. He had boxed the ears of the member of the Photographic Society, who now reported this indignity to his fellow-members and wanted to know what they proposed to do about it. An insult to one of the senior members, he implied, was an insult to the Society as a whole. With this most of the members, including John Baird, agreed.

What, then, were they to do? Mr. Forbes kept pigeons; so there was one obvious way of getting revenge. They forthwith got a ladder, went to Forbes's pigeon-loft and propped the ladder up. One of the members climbed up the ladder, with John Baird standing on the bottom-rung and holding it firm. The pigeons were ruthlessly pulled out, their necks wrung, and their bodies passed down to Baird at the bottom of the ladder. John Baird was by this time not at all happy about the whole affair, and he wondered if, in their hot temper, they had not gone a bit too far—but it was too late to draw back.

In actual fact, they took the pigeons to a nearby fishmonger, to whom they sold the unfortunate birds at fourpence each.

Mr. Forbes was proud of his tulips, which had won many prizes at local flower-shows. So the next move was to his flower-garden, where all the best tulips were cut down and laid in a neat row on the front doorstep. They then tied a

long string to the bell on the door, retreated to a distance, and pulled the string.

When Mr. Forbes came to the door he was met by a shower of balls made from mud and water.

This was an episode that always remained in Baird's memory as one of the things which he would like to have rubbed out of his past. It was known to all the members of the Photographic Society that there would be trouble, if Mr. Forbes reported this to the headmaster. There were therefore many resignations from the Society. The Committee hurriedly passed a rule that anyone wishing to resign would have to pay 5s. But this rule was ignored, and from the day of the pigeon and tulip raid the society broke up, never again to be reformed. It was one of the greatest regrets of John Baird's young life.

Yet his interest in machines and the inventing of exciting devices soon found another outlet. This was nothing less than the attempt to build a machine that would fly—though it was more in the nature of a glider. His closest school friend at this time was a boy called Godfrey Harris, and the two boys built a machine which they thought would take the air. It was made rather like two box-kites joined in the middle with wood battens. It took them only about two weeks to make this odd-looking machine. Then they decided that it was time to try it out. If they found that it would glide in a satisfactory way, they would attempt to get some sort of engine fitted to it, so that they could fly for considerable distances.

Just how they managed to do this without their parents being told anything about it, it is difficult to understand. The fact that Mr. Baird was very stern and forbidding would, of course, mean that John tended to keep all his most precious ideas secret; and if Mr. Baird had known what the two boys

were trying to do, he would certainly have vetoed the idea.

At any rate, they contrived to get the glider on to the roof of John's home. They thought that it would be possible to push it off the edge of the roof, and to glide smoothly down into the garden. This was the theory; but it worked out a little differently.

Baird was sitting on the machine, trying to decide what was the most comfortable position, and without any idea of attempting his first flight. Then, almost before he realized what was happening, Godfrey Harris was pushing from behind, and the glider, with its inventor sitting on it in a most uncomfortable way, was sliding off the edge of the roof. Baird gave one wild shriek; but it was too late. The machine moved rockily in the air, broke almost at once into two pieces, where the joined kites had not been fastened securely enough. John Baird was, in a matter of a few seconds, landing on the lawn. He was bruised, but otherwise unhurt. His first real invention had been tried out. But it was woefully wanting!

When he wrote down some stories of his early life, long years afterwards, Baird said that he had never again had any desire to fly. But the modern air-liner is a little different from that early double-kite type of glider. In any event, the failure of this flight removed any desire to invent a flying machine, and from that moment it seems that Baird abandoned it. Otherwise it might have been his destiny to see his name in the roll of the famous who contributed to the development of the aeroplane.

Godfrey Harris, who was Baird's friend, was in some respects a bolder person than John Baird himself. Harris went to the University, gained a B.Sc. degree, and went to the United States, where he established himself as a farmer. Some years later Baird was to hear of his friend's tragic

death. Harris tried to clear some of his land of unwanted trees. Perhaps because of his scientific leanings, he used some dynamite to blow up the deep-rooted stumps; one charge of dynamite exploded before the expected moment, and poor Harris was killed.

But before all this John Logie Baird's career was to proceed along rather unexpected lines. He had learned all that the school could teach him, and this did not amount to much. Its routine of Latin and history did not appeal to him. By now he had come to see that his future lay in his inventive mind. Even though the flying machine had been a complete failure, it had given him some idea of the way in which he might one day go. His experience with cameras, had taught him that it was in some sort of development of machines that he might find himself working.

So he persuaded his father to let him go to the Royal Technical College at Glasgow. He travelled up each day from Helensburgh, thus becoming what would now be called a commuter. This meant that he was not taking part very much in the social life of the college, for when the classes ended he was soon dashing off to catch the first possible train for home.

He did not find the work difficult. But several times he was ill—the chills and colds which were to worry him all his life began. The College Diploma, which normally took three years, occupied him five years, though in the end he got it.

He also did what was more unusual in those days than it was to be later on, in that he did some practical training with engineering firms at the same time as he was pursuing his College course. He had a period, for instance, with Hailey's Industrial Motors at a place called Yoker, near Glasgow. This was a job which he thought would be full of interest; but he was soon to find the work hard. For one thing, the

works started up at six in the morning. Officially work stopped at half-past five at night; but there were often urgent jobs to be done, which meant that a good deal of overtime had to be worked. Often he was still at the bench at eight o'clock at night!

The work, too, was monotonous. Naturally, a young man without any practical experience could not be given very exciting tasks. This was in 1909, when Baird was twenty-one years of age. He spent some weeks at this factory, in icy-cold weather.

His first job was chipping little grooves out of some steel castings. These had to be done accurately; and the only tools he could use were hammer and chisel. "Week after week," he wrote long afterwards, "I chipped those little grooves." The dullness of the work, and the coldness of the workshop itself, inevitably brought on one of his perpetual colds, and he had to stay in bed while the cold worked itself out of his system.

He could not get home to Helensburgh, except at weekends, while he was doing this work. So he found lodgings in Glasgow itself. He had not much money, which meant that he had to stay in shabby streets, where the lodgings were uncomfortable. He slept on hard beds and ate unappetising food. So, though he had been unhappy at school, he found his life still dull and monotonous while he was working at these factories, with the idea of earning a little money and getting a little practical experience.

His father, while wanting John to get on in the world, found it very difficult to understand what his son wanted to do. Sometimes John would pick up a copy of some illustrated paper, and see pictures of wealthy young people basking in the sun of the South of France. Then he would compare this with his own life, and would feel very bitter about things.

Some of the Scottish working people of those days turned to politics in an attempt to improve their conditions; but John Baird thought that he had within his own power the best chance of pulling himself out of the rut into which he might be getting.

Indeed, he thought of himself as what he called a "short-term prisoner." Though he was unhappy in his work, he was sure that more interesting and exciting times lay ahead of him. He was not at all certain of just where these new things would come from; but he felt in his own mind that he would have a happier future somehow.

During those years, too, the First World War was looming on the horizon. For all those of Baird's generation, that war in a sense split their careers in half. Even if they did not join the army, they took up some kind of war-work, and found, by 1918, that the conditions of 1914 had gone for ever.

It was in 1912, two years before the outbreak of war, that Baird gained his diploma from the Technical College. Sometime later he found that those who had been awarded this diploma were allowed, if they wished, to go on to the Glasgow University. The course there was a short and intensive one; after only six months' work, they could sit for a B.Sc. degree.

Again he had something of a battle with his father over this.

"Why do you want still to go to college?" his father asked.

"A degree will qualify me for all sorts of good jobs," John answered stubbornly.

"What sort of job?"

John grinned. "Who can say, until I've got the degree and start applying for them?" he said.

In the end his father rather unwillingly agreed that he

should have this extra six months, in order to give himself the extra qualification of a university degree.

This six months at the university was one of the happiest times of John Baird's life. For one thing, unlike the Technical College, the University had a very busy social side. There were hundreds of students, among whom Baird found several whose minds worked in something like the same way as his own. They used to sit about for hours, arguing and putting the world to rights in their minds. But, as John had spent a year and more time in a factory before coming to the University, he was suddenly faced with a difficult decision.

Before he had finished his university course the war broke out. To begin with everyone said that the war would last only for a few months. Before Christmas, 1914, it would all be over, they said. Germany would crack under the pressure of British and French arms.

John Baird, when he thought about all this, was not so sure. He felt that maybe he owed a duty to his country; so he went along to a recruiting office and asked if he could join the army. He was directed upstairs to the medical officer.

Baird had always been thin and wiry; and when he had taken off most of his clothes, the doctor looked at him somewhat suspiciously. There was also a medical orderly who was measuring and weighing the recruits.

The doctor asked: "Do you suffer from colds very much?"

"Pretty well every winter," Baird replied.

"Every winter you're knocked out?"

Baird nodded.

The doctor gave him another glance, and then said: "You can get dressed now." Then he pulled a piece of paper towards him, hastily scribbled something on it, and handed it

to the would-be soldier. Underneath the writing the shrewd old doctor had thumped a large rubber stamp.

John Baird looked at the document. "Unfit for any service," the rubber stamped message read. As he left the building, the attendant who had sent him upstairs for his medical examination looked at him and said: "You're back quickly."

"Unfit for any service," John Baird commented, and left the man staring at him in some surprise.

The First World War, which killed so many promising young men, and ruined the careers of others, seemed likely to have very little effect on Baird's career.

CHAPTER TWO

STRUGGLES

THE six months at the University over, Baird found that a B.Sc. degree was not quite the royal road to riches and a good job which he had expected it to be. He applied for a number of posts; in the end he was appointed Assistant Mains Engineer to the Clyde Valley Company. This was, of course, long before the setting up of the modern electricity boards, and the supply of electricity was kept up by a number of companies. Some of them were large, covering a wide area; some of them were comparatively small. Baird was stationed at Rutherglen; and his main task was, if the supply of electricity broke down anywhere in his area, to go out, discover what was wrong, and supervise whatever repairs were needed. He had a gang of unskilled workmen helping him; but they knew little about electricity, and could do their work only if the engineer told them what to do.

There was a telephone by John Baird's bedside; and if there was a breakdown at any time of the night, he had to go to the site of the trouble and investigate. It was a horrible job, and it seemed to him that the telephone bell always seemed to ring at an inconvenient time on the coldest and wettest nights of the year.

One night, when it was pouring with rain, he was called out, and had to stand in the heavy rain for many hours, while Stibbs (the chief ganger) and his men dug holes in the road in an attempt to find a faulty cable. Most of the men were

Irish labourers; and at four o'clock in the morning they wanted to drop the whole thing and go home to bed. Baird had one of the toughest assignments of his career to persuade these men to carry on. There were occasions, too, when the men had had too much to drink, and drunken fights between one group and another would break out.

For this responsible job Baird was paid thirty shillings a week. Naturally, with his tendency to suffer from heavy colds, he was frequently in bed with a high temperature. He could not hope, he thought, to get a better-paid job, because the frequency of his illness would make him suspect to any employer whom he might approach.

There was one night when he thought the worst had been reached. Some of the electric mains had metal manhole-covers, giving access to the tunnel in which the mains ran. It was on a dark, cold night, with the rain pouring down, that one hot-headed Irishman hit another, just as one of the big manhole covers had been lifted. The man who had been hit fell down the hole, and had to be fished out. Both the men then left, and Baird had the task of continuing to find the fault in the cable with two of his best workmen missing.

He was always trying to get something better to do. He knew that he had it in him to do finer work than this drudgery. He wrote to the head of the firm, asking if they could not find him something more suited to his ability. And then, when he was in the office one day, he saw his letter lying on a desk. The chief engineer had written on it: "We cannot give Baird a better job. He is always ill."

This was the finish. There was only one thing to be done, he decided. He would have, somehow, to strike out for himself. He would have to find some way of working in which he was his own master, not at the beck and call of someone else. Then, if he did get a few bad days with colds or

influenza, he could stay at home and nurse himself back to better health.

Meanwhile he was trying out various experiments. In the Clyde Valley electricity station, for example, he tried to make diamonds! There were, naturally, not breakdowns every day; sometimes Baird would have hours to himself, with very little to do. And it was on one of those slack days that he conceived the idea of making artificial diamonds.

Diamonds are made of the element carbon, which is the same as charcoal. But it appeared that the black form of carbon could be converted into the shining form only by being subjected to high temperature and pressure. Baird asked himself: Why not produce high temperature and pressure artificially, and get some rods of carbon turned into diamonds? The idea was simple enough; it was putting it into practice that was the problem.

John Baird spent a long time thinking about the way in which this could best be brought about. His experiences with the glider had taught him that if you wish to do something quite new, and you do not want to make a horrible mess of your project, you have to know a lot before you start work. Baird had never been much of a chemist, and in a way turning an ordinary black stick of carbon into shining diamonds was a chemical problem. So he started reading everything that he could lay his hands on about this problem.

Then he thought that he had found a way of doing it. He got a thick bar of carbon and filed it down to a thin rod in the centre. Then he connected an electric wire to each end and put the rod in an iron pot which was filled with concrete.

The idea was that he would switch on electricity, so that there was a sudden surge of current through the carbon. It would get very hot; and the fact that it was embedded in

concrete would mean that as it expanded under the great heat it would be subject to considerable pressure.

It seemed on the surface as if the scheme was quite workable. So now all that he had to do was to wait for a quiet moment, when there was no one about. Then he could connect his diamond-making machine to the electric mains, and switch on the current. He knew, of course, that there was a danger that this would cause a main fuse to blow somewhere. If this happened, it would mean that the electricity would fail over a wide area. Baird had new fuses all ready, so that he would be able to get the current flowing again quickly to all the company's customers.

He selected his moment. He switched on the current. There was a loud bang from the pot in which the carbon rod was fixed. A cloud of smoke rose from it. And, as he had anticipated, a main fuse blew.

Quickly he repaired the fuse. But he had left the wires connected to the iron pot.

The chief engineer came running in, just as Baird had got the current going again.

"What on earth is this thing?" he asked, looking with amazement at the arrangement of wires.

Baird knew that he would have to give some sort of explanation. So he told the truth, saying that he had thought it might be possible to turn ordinary carbon into diamonds.

"You used this company's apparatus, and this company's electricity, for silly experiments of your own?" said the chief engineer.

"I suppose you could put it like that," admitted John Baird.

"It might have been a very dangerous experiment, too," his chief said. "I suppose you didn't think of that?"

"I knew it might blow the fuses," answered Baird. "I was prepared to replace them—indeed, as you can see, it has been done."

"Get on with your work, Baird," retorted the chief. "And don't let us have any more of these stupid experiments of yours. If you do that sort of thing, you won't be in this job much longer, I can tell you."

Baird was very hurt at this reaction. In actual fact, of course, the chief engineer was quite justified. Baird had no real right to use the company's apparatus and its current for purposes of his own. But he felt disgruntled and annoyed that he should be treated in this way.

It so happened, too, that a good deal of emergency work needed doing later that day. The result was that by the time he came back to look for the iron pot—which he confidently expected to be full of diamonds—it had vanished! It was never seen again. Someone had tidied it away or thrown it on some rubbish dump. So he did not have the satisfaction of seeing if diamonds could really be made in the way he had thought possible.

The more John Baird thought about his life the more he came to see that he would never get anywhere while he was chasing about Scotland mending faulty electric mains. The job brought him enough money to live on, and that was about all that could be said for it. He had no time and little energy to devote to anything but the routine tasks that came his way day by day and week by week.

There was only one way of breaking away, as far as he could see. He would have to launch out for himself. He would have to be his own master. But to start any sort of business needed money. He had no money. So what could he do?

He decided, after thinking about this night after night,

that he would have to invent something useful. It would have to be something that was fairly cheap to make. It would, too, have to be something for which many people were looking, and which they would be prepared to buy.

What could it be? Then, on one cold night when he was on his way to repair a broken cable out on an icy country road, he had a brain-wave. His feet were so cold that he could hardly feel them as they trod the surface of his road. Cold feet! An awful lot of people had cold feet. Could he do something or invent something that would enable people with cold feet to keep them warm?

He himself had long suffered from cold feet, and he thought that he had found the answer. He used to take off his socks, wrap a newspaper around his bare feet, and put his socks on again. Then his feet kept warm for quite a long time.

This, he said, was because socks were always slightly damp. Wool tended to absorb moisture from the air. So, even if a person heated his socks in front of a roaring fire before putting them on, they would get damp again in a fairly short time. Then the feet would get cold. Why not invent a kind of undersock which would not get damp? This would protect the feet of the wearer from the moisture that the wool socks would absorb.

His scheme of wearing newspapers under his socks he found quite satisfactory. But clearly he could not have paper undersocks made. They would be too flimsy. They would tear too easily. What then? "The Baird Undersock." That sounded good. He would be able to get them on the market without spending much money. And if they really worked, they would be a paying proposition.

Baird went to a shopkeeper and talked about his ideas. He was soon put in touch with a hosiery manufacturer in the

town of Hinckley in Leicestershire. From this man he got six dozen pairs of socks. They were made from unbleached cotton. He sprinkled the insides with the chemical borax. He bought some large envelopes, had "The Baird Undersock" printed on them. He also spent a little money on a printed pamphlet, describing the wonders of warm feet. It described his sock as "warm, medicated, absorbent, worn under the ordinary sock, keeping the feet warm in winter and cool in summer."

Now there came the problem of putting them on the market. Baird rented a small office in St. Vincent Street, Glasgow. He hoped, of course, soon to resign from his post in the electricity supply industry. From now on, he decided, he would be his own master, and would make his fortune. If selling socks would do it, he would base his life on socks. If not, he would turn his ingenious mind to something else.

He advertised his socks at ninepence a pair in a Glasgow paper. The advertisement cost thirty shillings, and he got one reply! Spending thirty shillings to make ninepence did not seem to be a way to make his fortune.

So he packed a few pairs of his special socks in a small suitcase and went around Glasgow calling on chemists. In a few hours he had obtained orders for all the six dozen which he possessed, and for more. So off to Hinckley went a request for a quick repeat order. There was one secret, he told himself—travelling and talking to shopkeepers was the clue to success. This meant far more, indeed, than newspaper advertising. It was, too, nothing like as expensive as putting advertisements in the papers.

Still, there was a limit to what he could manage himself in the way of commercial travelling; if he was to build up his undersock business into something really big, he would have

to get extra travellers, so that more and more shops could be visited.

He thought about this problem; and then one evening he saw the way. There must, he told himself, be a number of travellers who called on chemists to sell soap or toothpaste or some such articles. Would not they take on the Baird Undersock as a sideline, being paid a small commission for such socks as they succeeded in selling? Moreover, though he himself had called chiefly on chemists why not try to approach clothing stores also?

This time advertising was the way. So Baird put a small advertisement in an evening paper, asking for travellers who were calling on chemists and drapers, and were able to take on a new product as a sideline. He had literally dozens of replies. Some of those who answered were covering Scottish territory; some were regularly in parts of England. He soon appointed agents in different parts of Britain.

There were not many sold in England, though Selfridge's, the great London store, took some. In Scotland, however, they sold very well indeed, and here Baird was able to keep in close touch with his travellers and see exactly what they were doing.

At last he was free of the drudgery of a routine job. His engineering training was, of course, not used at all in the marketing of the undersocks. But he had always thought that he would make his way in the world by inventing something that people wanted. It looked as if he had at last managed to do this. When he went to his one-room office in St. Vincent Street, Glasgow, he had a sense of excitement. The orders fairly poured in. At ninepence a pair, he was not making a big profit on the socks; but he was selling enough pairs to find the money beginning to pile up.

He thought that he might fairly spend a little on publicity. Not the ordinary advertisements in the papers, which were a waste of money. But something that would make the papers take notice of Baird and his undersock.

Here he had yet another brainwave. Sometimes he had seen sandwichmen, as they were called. These men, carrying boards in front and behind them, often advertised theatres and restaurants, and sometimes shops which had special lines which they wanted to sell in large quantities. Sandwichmen! Then Baird thought of something that would be different, and might attract attention. Why not have sandwichwomen? He therefore recruited some women to parade the streets of Glasgow, carrying boards describing the Baird Undersock and its great value in winter of preventing the horrible condition of cold feet.

This was perhaps the most striking bit of publicity that could have been devised. The papers took photographs of the women. The words "Baird Undersock" naturally appeared on the sandwich-boards in big print; and so, when the women's pictures came into the papers, Baird's name was at once associated with this new scheme. The public of Glasgow became conscious of the Baird Undersock and its advantages. Not only the public of Glasgow, either, for some of the pictures reached well beyond the Scottish city, and were published in the national newspapers in London.

For a time Baird had managed to continue his job in electricity with the pressure of selling undersocks. He knew that he would have to resign that post pretty soon. It was after the publicity over the sandwichwomen that he severed his connection finally. From now on, he would, he told himself, be completely on his own. It was up to him to make his own way in the world of commerce. He had little doubt that he would be able to do this.

Chemists sold a fair number of the socks; but it was the big drapery stores which proved to be his main source of success.

Indeed, he was able, by a cunning move, to make sure that some of the big shops made a big show of his socks. One shop in Glasgow had bought a dozen pairs, but when Baird called in there one day there were none on display.

So he asked some of his friends to call in and ask for a pair. After all, he argued, it meant that they had to spend ninepence; but if a few people spent ninepence each, it would encourage the shop to buy a lot more, to meet what seemed to be a great demand. So some of his friends went to the shop and asked for a pair of Baird Socks. Soon there were about a dozen people clamouring for the socks, and the shop had none left. A message was sent around hurriedly to Baird's office in St. Vincent Street, asking for a bigger supply. The shop added that they wanted them immediately, as they had customers waiting for them!

Baird's strategy had paid off. He himself was out when the buyer from the shop called at the office; but a note was pushed through the letter-box, stressing the urgency of the order.

When Baird returned he saw how successful his scheme had been. He at once packed up fifty dozen pairs, and took them around to the shop himself. When next he called there, he found that the shopkeeper had put up a special counter to sell the socks, and had made a special display of them in one of his windows. So the socks went on selling in enormous numbers.

The success with the one shop—one of the main stores of the city of Glasgow—led to other stores taking up the selling of Baird Undersocks. Soon he was so swamped with orders

that the Hinckley manufacturer was hard-put to keep up with the demand.

This seems an odd beginning for a man who was in the end to make his name in the world of television. But it shows well enough that Baird was man with a really inventive turn of mind.

The Baird Undersock kept him occupied for little over a year; and during that time he made not much short of £2,000—he calculated that if he had continued in his work for the electricity company it would have taken him a good ten years to earn as much as he made in one year while marketing his undersocks. His decision to strike out on his own was thus triumphantly justified.

But—as happened so many times in his career—his health brought his business to a stop. He started one of the feverish colds that so often afflicted him. For a long period he had to stay in bed. Then, when the worst of the cold was over, he decided that, as it was damp and cold outside, he would have to stay indoors for a good while longer. His business was, in a sense, a matter of his own energy and his own initiative. When he was away from the office, the business rapidly fell away.

The travellers would come with orders, only to find no one at the office to take them. His Hinckley supplier filled up with work for other tradesmen. And so, when Baird did eventually get back to work, he found that much of his business had vanished.

He was not unduly bothered by this. He knew that now he had the secret of success. What had to be done was to find something that people needed, to make it at a price that was within the reach of the ordinary man. If he could do this, he would, he felt sure, be able to repeat with something else the success that had come to the Baird Undersock.

What would it be? And where should he go, in order to launch some new scheme in the world? These were not easy questions. His bad health made him wonder if it would not be better to get away from Scotland, where it was so often raw and damp, and try to make a career in a country where the climate was kinder and easier to endure. He now had about £1,600 at his disposal, which meant that he was no longer driven to make quick profits. He would be able to live on his capital for a time; that would make it possible to look about quietly, getting what advice he could.

The day of television was not yet. But Baird's inventiveness, it seemed, was so striking that sooner or later he was bound to hit upon some idea which would lead him to fame and fortune.

CHAPTER THREE

TRAVELS

IT was a letter from Baird's old friend, Godfrey Harris, that really decided the move that he now made. Harris had gone out to the West Indies, and he wrote Baird the most enthusiastic letters about Trinidad, where he was living. It seemed to be just the sort of place for which Baird was looking. It was warm and not cold and wet, like Scotland. If he went there, Baird thought, he might at last be able to get away from the colds that so often beset him—and usually at the most inconvenient times!

A tropical paradise where the sun always shone seemed to him so attractive that he made up his mind to go there. He wrote to Harris, telling his friend of this decision. He went down to the docks, to try to find out if there was any chance of booking a place on a cargo ship. He thought that this would be much cheaper than travelling on some transatlantic liner. It would also, perhaps, be more interesting.

He managed to get a place on a ship. So he closed down the Baird Undersock business without much regret. He spent some of his money on various kinds of cotton goods (including undersocks!) and filled three trunks with what in effect were samples. He thought that perhaps he would be able to work up an importing business in Trinidad. He had been to see some of the wholesale warehouses in Glasgow, and told their owners what he proposed to do. Naturally they were quite happy at the possibility of building up a new

line of business, exporting to the West Indies. Baird knew precisely nothing about selling to the natives of Trinidad. He thought that, after his experiences with the undersocks, he would have little difficulty in selling British goods in a British colony.

The voyage was not as interesting as he had hoped. To begin with the ship was not really big enough for a passenger who was not a practised sailor. It pitched and tossed with every wave. Baird felt ill a good deal of the time. There is no illness more unpleasant than sea-sickness, and he suffered from it almost continually in that ship. During the intervals when he felt better he talked to the captain and to a fellow-passenger, a man from Venezuela. This hard-headed businessman looked at the samples that Baird was bringing with him.

"You think you will sell them to the natives?" he inquired.

"Yes."

The man shook his head emphatically. "You will never do it," he said.

"Why not?" asked Baird.

"The natives do not want European goods. And if they did they have no money to buy them," said his friend.

The man clearly thought that Baird was crazy. John had told him of his success with the undersocks, and the man from South America could not understand why he had not stayed on and built this business up again. He considered that there was a far better chance of making a fortune that way than in this crack-brained scheme of building up an importing business in Trinidad.

Baird was a little depressed at this reaction. It was, however, too late to do anything about it now. He had in effect burnt his boats. He could not go back and start the under-sock business once again.

The captain was not much more encouraging. He warned Baird that there were a number of highly unpleasant diseases which were rampant in the tropics, and laughed at the idea that a man from Scotland could possibly come to the West Indies for his health.

However, the apparently endless voyage actually lasted only for about three weeks. In the end Baird saw a sunlit harbour and knew that he had arrived at his destination. This was the harbour of Port of Spain, the principal port of the island.

He had asked his friend Harris to book him a room at some not too expensive hotel. As he walked ashore Baird thought that he had been much misled by Harris. It was hot. That was true. But it was a moist kind of heat that made him feel limp and lifeless. The quayside was jammed with people. A very mixed lot of people they were too—black men, Chinese, Hindus, Portuguese and many other Europeans of different countries. As he looked around him, Baird thought that most of the Europeans looked sallow and unhealthy. He wondered, once more, if he had been wise to leave the familiar streets of Glasgow for this strange land on the other side of the Atlantic.

But he had to find the Ice House Hotel, which was the place where a room had been booked for him. The hotel was not very impressive; but he was thankful to make his way up its stairs to the bedroom, where he partly undressed and lay on the bed, wondering what on earth had made him come to this place.

He did not feel well on arrival. But in a day or two he felt much worse. A doctor was called in, who announced that he had a disease called dysentery. Baird was told that most British people who came to Trinidad in those days suffered from it at one time or another. Few were stricken with it

within a matter of days of their first arrival, however. He had to stay in bed for some days, but gradually he came back to something like normal health, though he still felt very weak.

He told himself that it was no use feeling sorry for himself about all this. He would have to get out and around Port of Spain, seeing what were the chances of making a living.

The hotel, though not luxurious, was not cheap. So the first thing he had to do, as soon as he got himself into something like health, was to find some lodgings which would not cost as much as staying more or less permanently in the Ice House Hotel.

He soon found lodgings, in a place called Columbia House, which was kept by a funny old lady. Baird said that she had a yellow face "of an almost unimaginable ugliness." But she was kind-hearted and she looked after him pretty well.

When he rang the bell and she came to let him in, he explained that he was looking for lodgings. She grinned cheerfully and said: "Come in, we'll take care of you here. I'll be a mother to you!"

If this was something of an exaggeration, the landlady did her best to make her lodgers feel comfortable. Baird shared a room with a man who was almost always drunk, so this did not contribute to his comfort, though he found the man cheerful enough.

During the intervals when his room-mate was sober, Baird showed him some of the samples of drapery which he had brought, and asked what were the prospects of getting some sort of importing business worked up.

His new friend was not much more encouraging than had been the Venezuelan on the ship coming over. However, he said that if Baird would allow him to borrow some of the

samples, he would go round with them, and see if there was any prospect of selling them. He also said he would try to find the names of the men who did the buying for the principal shops, so that Baird could call on them and try to interest them in the goods which he proposed to sell.

It seemed a not unpromising beginning. But Baird soon found that those who had warned him against this scheme had been talking very good sense. For three weeks he tramped the streets of Port of Spain. He called at many shops. He met the buyers, who were a very mixed crowd. Some of them were negroes, some white men. The white men were sometimes British, sometimes Portuguese. What they all had in common, however, was a reluctance to buy the goods which Baird had to offer them.

At the end of three weeks of really hard work, all that he had secured in the way of orders was one order for five pounds of safety-pins.

His scheme had failed completely. Here he was, on the other side of the world from home, and without any way of making a living. What could he do? True, he had some of his money left, but he knew that he would not be able to live on that for long.

All that he needed to complete his misery was an illness, and this duly came. It was a raging fever—probably malaria which attacks so many white people in tropical countries. For several days again he lay in bed feeling wretched, while round and round in his head there spun idea after idea. What could he do? How could he make a living? He dismissed any idea of going back home again, though he could have afforded the fare. He did not want to admit defeat. Before coming out here, he had told his parents that he was sure there was a fortune to be made in the West Indies. They had been very dubious about the whole scheme; and he was

resolved to show them, by hook or by crook, that he had not been mistaken in his ambition.

Then, while he was still suffering from the fever, an idea came to him. The island, he recalled, had all sorts of crops of fruit, there almost for the picking. Also sugar was grown. Mangoes were to be seen everywhere, at a very low price. Why not use the fruit and the sugar to make jam? And mango chutney could be made as a sideline.

He was not put off for a moment by the thought that he really knew nothing about the industrial processes of making jam or chutney. After all, he told himself, he was a qualified engineer, and surely any engineer would be able to get a vat of fruit and sugar boiling at the right temperature to turn it into jam. It would be the easiest thing in the world. The more he thought about the idea, the more he liked it. West Indian jam to export to Europe! Why not? And he would no longer have the problem which had killed his previous scheme—the problem of selling to an unfamiliar market. He knew the sort of jam that was liked in Britain, and all that he had to do was to produce something which was more palatable and cheaper—and his fortune would be made! Baird was always an optimist when he was working out a scheme. His heart went into his boots a bit later, when a scheme went wrong.

First of all, he told himself, he would make some jam and sell it locally. Then when he had made himself familiar with the process of making the jam and chutney, he would start exporting it to Europe.

In theory the idea was sound enough, and as soon as the fever had left him, Baird set about putting it into operation.

He made inquiries as to the best fruit-growing area in Trinidad. It would be a good thing, he thought, to set up in business as near as possible to the fruit, so as to avoid time and

expense in transport of the fruit itself. The best fruit, he was told, was to be found in the Santa Cruz Valley; so here he found a cocoa planter, who was prepared to rent a room to him. It was a fascinating spot. The bush grew all around. Just outside Baird's bedroom window was a clump of enormous bamboos. The place was as different from his Scottish home as could well be imagined.

It was an extraordinary situation for a young man from Scotland. But John Baird did not allow himself to be put off his stride by the unusualness of his surroundings. The jam was going to be made—on that he had made up his mind. The best way, he told himself, was to make it in the open air. After all, except for a rainy season, there was no reason why an outdoor factory should not succeed, and it would save all the time and trouble of building a warehouse.

The first thing to be done was to get a vat or other vessel, big enough to hold a large quantity of fruit and sugar. Baird had secured two assistants—Tony, a young man whose surname he never discovered, and a Hindu called Ram Roop. With the help of these two he managed to get into position a large copper pan, which he had brought from a scrap merchant in Port of Spain. It had been used as a washtub in a laundry; Baird calculated that it would hold about a hundredweight of jam, so he started the work on a fairly large scale.

Underneath the pan they built a brick fireplace, and they filled the pan with oranges, duly cut up, and sugar. Baird had read some cookery books, to be sure that he got the proportions correct.

They then lit the fire, and armed themselves with large wooden paddles. The idea was that as soon as the fruit began to boil, Ram Roop and John Baird would keep the mixture well stirred.

The weather was hot to begin with; the heat of the fire added to the normal tropical temperature made the place almost unbearable. Baird took off his coat, then his shirt. Soon he was standing by the pan, wearing only a pair of trousers.

The mixture in the pan began to bubble, and the two stirred vigorously. The sweet smell of the marmalade suggested that they were going to have a very successful session. But the smell, if attractive to human beings, was also attractive to insects, and soon these began to arrive. In a few minutes the air was thick with flies, ants, and every other variety of insect that could be well imagined. They flew into the sweet-scented steam that was arising from the pan, and then fell into the jam.

Baird did not know how many of these thousands of insects might bite or sting. He dropped the stirrer and ran for cover. Ram Roop did not appear to be much worried, and went on calmly stirring, in spite of the buzz of thousands of insects.

After the first invasion of insects they slowed down somewhat. Ram Roop went on stirring, and Baird came out from his hiding place. Finally, when the jam had been boiled, they managed to get it poured into glass jars. Not much was wasted, though Baird had a few qualms when he thought of the number of insects that must be in it!

He had, indeed, under-estimated the trouble that insects were likely to cause. His jam-making was a real ordeal in the main because of their attacks. On one occasion a swarm of enormous ants arrived, and carried away, grain by grain, about a hundredweight of sugar. Great spiders crawled up and down the wall of Baird's bedroom. Beetles and cockroaches wandered to and fro on the floor. Moths flew in and out of the windows, which had to be kept open because of

the heat. Mosquitoes abounded. It was surprising, in view of the fact the mosquitoes are generally thought to cause malaria, that Baird did not suffer from this fever more often.

However, he somehow faced all these insect pests, and went on making jam. But then, when a certain amount of stock had been accumulated, he had to try to sell it.

Here he struck a difficulty rather like that which had faced him on his first arrival in Trinidad. A man from Britain did not really know how to persuade the local shops to stock the goods that he had to sell.

He had now taken rooms with a man in Port of Spain. If he was to visit shops and sell the jam, he could not live out in the jungle. This man, called Harold Pound, soon became a friend. He had some ideas of selling; but Baird could not manage to persuade the local shopkeepers to take more than small quantities of the jam that he had made. Stocks had piled up, and he did not see how he was to sell the huge quantity of jam that would go bad in that hot climate, if not disposed of fairly quickly.

Even in Port of Spain insects still pursued him. One evening he came in and saw Harold Pound sitting at the table, looking solemnly at an insect, rather like an enormous grasshopper, which was looking back at him. It was, in fact, a huge locust, and for a time they kept it as a pet, in a small bird-cage.

But the jam was almost unsaleable in Trinidad. There was, Baird decided, only one thing to do. He must go back to London, taking with him some of the jam, marmalade, mango chutney, and other things which he had been making. He persuaded Pound to come with him.

In London, after a voyage that was a little less disastrous than the outward one, he took a small shop, where he stored the various preserves. Then he started going the rounds of

the provision merchants and wholesale grocers, carrying with him plenty of samples of his wares. But the London merchants were no keener to buy than the shopkeepers in Trinidad had been. Soon he decided that the whole jam-making adventure had been a mistake. He had lost a lot of money over it, and he regretted not having continued with the really very prosperous business of the Baird Undersock.

The stocks of chutney and other articles he sold, in the end, to a sausage-making firm—they would use anything that was not actually poisonous in their sausages, he said. He got £15 for the lot; it had cost him some hundreds of pounds to make. So, once again, he was faced with the problem of making enough money to keep himself alive.

He was at this time living in a tiny attic in London. It was in Bloomsbury, not far from the British Museum. He tried to exist as cheaply as he could, for he now had only about £200 left out of the large sum of money that he had taken to Trinidad. Yet he felt sure that he would find something to follow up the socks and the jam. Surely there must be something that he could make—something for which people would be prepared to pay? He sat in his cold and dismal room and wondered to what he could turn his hand. The way of the inventor is hard; but the way of the inventor who cannot think what to invent is harder still.

He did a few deals in articles that he bought at the docks. Once he bought two tons of Australian honey, which was on sale at a very low price, and made a fairly useful profit by selling it in tins.

In the end it was Harold Pound, his friend from Trinidad, who came to his rescue. Pound had an uncle who owned a little shop, with some surrounding land. He wanted to get rid of this, and sold it to Baird for £100. There was a small business in seeds and other horticultural goods, like fertilizers,

going on there, and this Baird was able to continue. It brought in a little money. There was also a good deal of storage space, where he could put the tins of honey and any other articles which he might buy. It looked as if he was becoming a businessman in a small way.

But—as happened so often—as the business showed signs of building up and bringing in quite a good living Baird was stricken with his inevitable cold. He had weeks in bed, and just crawling around the house. The shop had to be shut while he was not available; the result was that the customers went elsewhere. And they did not come back. So by the time Baird had got back to reasonably good health again, he found that the business which had been keeping him going financially had almost vanished.

A friend of Pound's was looking for some premises. He paid Baird £100 for a half-share in a business that was almost non-existent. And Baird had had the good sense to insure himself against illness. The insurance company was paying him £8 a week under this policy.

But this source of income stopped when he recovered. He got back the £100 which he had paid Pound's uncle. But he was no better off. What, he asked himself, could he do now?

He used to read a trade paper for grocers; and here he saw some soap advertised at a bargain price. The soap was not particularly good in quality; but it could be put on the market at a price far below that charged by most people. Baird bought a lot of this soap, called it "Baird's Speedy Cleaner," and started off on a new career as a soap merchant. His experience with the socks stood him in very good stead here. He knew that if he made it appear that this was something quite new, and something not obtainable elsewhere, he might get a little corner of the soap market which was all his own.

To begin with, he stacked a lot of the soap away himself. But he felt that he ought to be going around selling it, not packing it away in store. So he advertised in an evening paper for a strong boy who wanted to help in a city warehouse. The result (according to Baird's own account of the incident, written years afterwards) was that hundreds of boys turned up. It was hardly possible for Baird to get to the door. He hastily grabbed the boy in the front of the queue, told him he had got the job, and pinned a notice on the door: "Job filled." Yet, according to Baird: "For days afterwards, strong boys hung around the street outside the office." This may have been a bit of an exaggeration. Yet it shows that in those days when so many people were unemployed there was great competition for almost any job.

The soap business, indeed, prospered. Baird even made it into a limited company, with a proposed capital of £2,000. His "Speedy Cleaner" was finding a market of its own.

Now there appeared a rival. This was a "Rapid Washer," put on the market by a lively young man called Hutchinson. He was Irish, and he thought that there was room for another cheap soap. Baird did not altogether agree. He thought that either of them might make a good living in isolation. If they competed against one another they might find that neither was making much money.

So the two men got together one evening at the Café Royal in Regent Street, to discuss the possibility of joining forces and making their two companies into one.

Hutchinson thought that they might well come to terms. He walked from Regent Street to the Leicester Square Underground Station, where Baird caught a train. They had sat long in the Café Royal, and when Baird went to bed he felt far from well.

His old enemy was attacking him again. The next morning

he woke with a terrible headache and a high temperature. At this time he was staying in a small hotel. His bedroom was icy cold, and this did not help him when he had one of his feverish spells.

Hutchinson had promised to call around and continue the discussion about the possible joining-up of the two soap businesses. When he called and found Baird in a bad state he was quite alarmed, and insisted on calling in a doctor without delay.

Baird, indeed, was getting worse. The doctor, when he had called two or three times, announced that there was only one thing to do—Baird must clear out of London.

"Where shall I go, doctor?" Baird asked.

"By the sea, for preference—somewhere on the South Coast," the doctor replied.

"You really think I need to do this?"

"If you stayed on in London much longer I would not answer for your recovery," said the doctor. "Sea air is necessary, and sea air you will have to get."

"But what about my business?"

"Sell it!"

Baird was not at all happy about this. His soap business had just begun to prosper, and the bad health that had dogged him for so long looked like ruining him just when he was on the verge of real big money. Still, he knew that it was of no use calling in a doctor, unless one took his advice. And the advice of the doctor had been most emphatic.

He told Hutchinson all about this. The young Irishman was very full of sympathy; but he repeated that it was certainly necessary for Baird to do what the doctor advised.

"But what about the business?" Baird repeated in his turn. "It's doing quite well."

"The doctor told you to sell it," Hutchinson said. "Well, that's all right. It is doing well, and you will be able to sell it."

"But who will buy it?" Baird asked.

"I will!" Hutchinson said.

In the end Baird sold all rights in his soap, and the existing stock which he held, for £200. So he was, it seemed, back where he had been long before, with about £200 to his name, with no home, and in a state of chronic bad health which demanded that he should leave London and go to live by the seaside.

It was all very well, he told himself, for the doctor to advise him to leave London and go to the South Coast. But to do such things cost money. He had £200—how long would that last in some seaside hotel?

This was in 1923. Baird was thirty-five years old. He had, it seemed, made one or two successful efforts to build up a business of some sort. Yet each time that he had been within striking distance of success, bad health had pulled him down.

There can be few men who are real pioneers in any field of human life who reach the age of thirty-five before they really find what they want to do. Yet this was so with John Logie Baird. If he had tried to look back at his life in 1923, it would have seemed a pointless sort of life, without any kind of pattern to it.

Selling socks, making jam, marketing soap—the various projects in which he had been involved had nothing in common, except that they all were efforts to make big money quickly. Two of them had been moderately successful; but each time they failed because of illness.

When Baird set off from London for Hastings he did not know that he was moving towards his destiny.

CHAPTER FOUR

THE APPROACH TO TELEVISION

WITH most great scientists or inventors, it is possible to see their interests developing quite early on in their lives. With Baird this does not appear to be so. His ideas were many and varied, and were concerned only with producing something which the public were prepared to buy.

When he went to Hastings in 1923, then, he had nothing especially in his mind. He had come to a decision that the ordinary commercial dealings on which he had spent his time in London, in Trinidad and in Scotland were not really the best way in which he could expect to make a living. The only way, he was sure, was to invent something which would meet a human need.

First he tried a new kind of razor-blade. This was to be made of thin glass. Indeed, the whole of the safety-razor was to be made of glass, which would not be liable to rust or tarnish, as are all such things made of metal. He tried this out on himself, when he had succeeded in making one; the only result was that he cut himself badly, and had to sit back and wait for the slash on his face to heal up! That was no good at all.

Then he recalled his undersocks. Many people, he thought, had feet that were uncomfortable in one way or another. Why not try to get something which would make walking more comfortable?

Baird thought of the comfort of a motor-car, driving on

pneumatic tyres. Why not, he asked himself, get pneumatic soles for shoes? A sort of air-cushion inside shoes would make walking a pleasure. It seemed at any rate a possible scheme, and it was something very easy to try out.

So he bought a pair of cheap boots that were very much too big for him, fitted two balloons inside them, blowing the balloons partly up, so as to form the kind of air-cushion that he had been envisaging.

Then he set off to walk along a street in Hastings. He had put his feet into the boots with the utmost care, so as not to disturb the balloons from their position.

He found that this scheme was not as good as he had anticipated. His feet felt unsteady. As he walked he lurched from side to side like a man who was drunk. Some small boys, watching him, hooted with laughter. Then there was a loud "pop." One of the balloons had burst!

So another of his possible inventions seemed to be unlikely to bring in anything in the way of results.

It was said by Baird's friend Sydney Moseley, who wrote a very good book on the life of the inventor, that it was during a long walk over the cliffs to Fairlight Glen that Baird first got a glimpse of the idea of television, which was to make him famous and was to occupy him for the rest of his life.

He was in much better health in Hastings, and long walks were part of the cure. Fairlight Glen is a well-known beauty spot, and it was here that he thought of television. Mr. Moseley says that there had been some gropings towards this in Baird's mind before, and even some early experiments; but no trace of these remain.

He recalled from his student days that it was possible to get a small cell made of a rare substance called selenium, which would transmit electricity. The ease with which the electric

current went through the selenium cell varied with the amount of light that impinged on it. In other words, this was a way of converting light into electricity and *vice versa*.

John Baird had, of course, been trained as an engineer. So he went back to the lodgings in Walton Crescent, which he shared with a friend, Guy Robertson. He sketched out a rough electric circuit, which he thought might be the kind of thing that he was after.

Then, while they were eating their meal, he told Robertson that he had invented a way of transmitting pictures by wireless. It appeared at first to be simple; but most inventors are inclined to be seized by an idea.

The idea in its outline was, indeed, simple enough. Baird had the thought that if he had a series of cells containing selenium, and if he arranged these like a kind of small pavement, he would be able to have an automatic device, by which the cells would be made more conductive where light parts of a picture intervened.

If one had a picture in front of a series of cells, then the cells would give a varying electric current. It would be a small current, and it would have to be very much amplified or enlarged before it would turn back into a picture again at the receiving end of the set.

The wireless valve, Baird thought, produced just what was needed in the way of amplifier; why not work it out along these lines?

Probably on that walk to Fairlight Glen, he had not developed it in quite this detail; but the first idea had come on him like a brainwave.

Robertson was not very keen at first. He said that all these people who wanted to do strange things by radio were a lot of cranks. He thought that Baird would be wiser to go back to his familiar ground of selling soap or socks. But Baird had

finished with that sort of business. It led nowhere, he said. This new idea of sending pictures by radio—now, there was something very worth while. There was something that would make his fortune!

Robertson sniffed. "All very well talking, John," he said. "Talk never got you anywhere. You've got to send the picture over a distance. When you do that—when you can give a demonstration—then I'll believe that you've got something really worth doing."

"I'll give you a demonstration, and I'll give it to you a lot sooner than you think," Baird announced.

The first things that Baird bought, in pursuance of this idea of transmitting pictures, made Robertson grin. His friend came home the next day with a tea-chest, a hat-box, a lot of glue, some knitting needles, and a big lens, which he had bought from a local cycle dealer. In his bedroom he set to work fixing these things together. Soon he was buying electric batteries and wireless valves.

Robertson still did not believe that this would get them anywhere. He felt that Baird was spending too much of the precious £200, which was all the money he had in the world. He was, too, spending it on things that might well get him nowhere at all.

The apparatus that Baird built in his bedroom looked quite fantastic. He knew that his first experiments would not get very far. If he was able to send a recognizable picture just for a few inches, or a foot or two, it would show that he was working on the right lines.

So what he did was to fix up an arrangement by which a cardboard disc could be spun. A knitting needle was the spindle on which the disc would rotate. In the disc he had cut a series of holes. In front of the disc he had set up a bright electric light. This shone on to the disc, and cast on it a

shadow from a little cross which Baird had made from cardboard.

The principle was simple, as has been said. There was a selenium cell behind the disc, and when the shadowy part was illuminated, the current passing was different from that when the full light could be seen.

The holes in the disc would then sometimes be passing through a large amount of light, and sometimes a very small amount. The current from the selenium cell varied accordingly.

These variations in current were passed to a receiving set, which contained wireless valves, so connected up as to amplify them.

All this was not done without difficulty. There were the financial difficulties—and on one occasion, when he had a large number of batteries connected together, he gave himself such a severe electric shock that he very nearly killed himself.

But on the washstand in his bathroom he eventually had the first television set, though it had not yet got that name. There is a sense of triumph in what he wrote down in his diary: "At last, to my great joy, I was able to show the shadow of a little cross transmitted over a few feet!"

The transmitting part of the apparatus and the receiving part were separated by several feet; but thanks to the miracle of the selenium cell he was able to send the outline picture over from one side of the room to the other. It was a very flickery picture, and he could not hold it for long. But this was enough to persuade him that his original brain-wave had not been a mistake. Sending pictures over distances was possible. He had done it! At that moment he saw into the future. Sooner or later, he told himself, there would be picture all over Britain—maybe all over the world. Great events

would be watched as they took place. The Cup Final, the Derby, Test Matches, royal processions, sessions of Parliament—people would be able to watch these things in their homes.

That first flickering cross on a very primitive screen gave Baird the prophetic foresight. Soon, he was sure, it would come. And when it came he would be the man who had brought it about. Possibly that moment was the greatest moment of his life, when he felt more excitement than he was ever to feel again.

But he knew, all the same, that he had a very long way to go, and a lot of hard work, before the first triumph could be followed up, and made into a really satisfactory way of sending pictures over a distance. Also he had as yet succeeded only in sending a single stationary object into a picture. What about moving things? And what about linking the picture to sound? It was all in the future, and he knew that it would come. But he knew that it would take a lot of time—and a lot of money. That was the greatest problem.

As a way of getting some more money—his was nearly all spent—Baird gave a demonstration to some of the newspapers. But few journalists came along. They thought that this was a silly crank, who had not really achieved very much. One London paper, however, did give him some space.

A friend of his father read this newspaper comment, showed it to the Rev. Mr. Baird, now an old man, and told him that he thought his son was on to something that might yet be the greatest sensation of the twentieth century. Baird had not seen his father for some time. He could not afford the railway fare from Sussex to Scotland. But his father, impressed by what his friend had said, sent him £50. This gift replaced some of the money that Baird had spent in the last

few months of progressive experiments; and he at once took a room above a small shop in the Queen's Arcade. He now no longer needed to go to bed surrounded by electric wires.

The shop cost him five shillings a week to rent; but it was money very well spent.

In this room he built more and more complicated apparatus. It was all an elaboration of that first piece of primitive machinery on the washstand of his bedroom. But results were improving. Huge rows of batteries, a series of spinning discs, and endless electric wires soon filled the room. But he found that his pictures were improving in quality. They did not flicker as much as had that first cross. He could now manage to transmit pictures of letters. They had to be cut out in bold outline; but the outline was quite visible on the other side of the room, at the receiving set.

By this time even the sceptical Robertson was convinced. This was Baird's claim to fame, he knew. Yet even so the problem of money remained. As yet no money had been coming in, except the £50 from Baird's father. And £50 does not last long when an inventor has to spend large sums of money on electrical apparatus.

Baird therefore put a small advertisement in the *Times*. It was headed "Seeing by Wireless," and it stated that an inventor wanted help in making models. He added that he did not want money, though doubtless this was what he was really hoping for.

The advertisement brought in a number of replies. One came from Mr. Odhams, who was the head of a famous publishing house. He sent two men down to Hastings, so that Baird could show them something of what he was doing. The two men were Mr. F. H. Robinson, who was a journalist working for the firm, and Captain A. G. D. West, who was chief research engineer of the B.B.C.

This looked hopeful, Baird thought. It meant that he had at last got the attention of men who would know something of what he was trying to do. They were both quite impressed by what they saw, but they realized, as Baird himself realized, that there was a lot of work yet to be done. An apparatus that would, as yet, transmit a shadow from one side of a room to the other was not of much practical value, they thought. Though they agreed, all the same, that the whole thing had exciting possibilities.

They reported back to Mr. Odhams, and the result was that Baird was asked to come up to London and see the head of the publishing firm in person. This, of course, he was only too delighted to do.

Baird had offered to sell to Mr. Odhams one-fifth of whatever he might make out of his invention if Odhams would pay him £100. The money was what he wanted to develop the scheme, and to buy extra apparatus.

Mr. Odhams, while he liked Baird, was not convinced that the problem was anywhere near solution. He did not take up the offer. But he did let Baird have some apparatus, and promised him that more would be available if needed.

"Well, now, Mr. Odhams," said Baird, "what demonstration would convince you?"

Mr. Odhams replied: "If you could put a machine in the room next door, seat someone in front of it, and then on a screen in this room show me his *face*—not a shadow but a *face*—I am certain you would get all the money you want. I am anxious to help you, but what can we do with a device that will only send shadows?"

This was in some ways disappointing for Baird. But he had at last been able to explain what he was doing to a sympathetic listener, and to a man who did not just dismiss him as a crazy inventor, doing experiments that would get him

nowhere. He thought that Mr. Odhams was interested; but he felt sure that he would have to go a good deal further before that interest was turned into money.

However, something else came out of this. Mr. Robinson, the journalist who had come down to Hastings to see the apparatus, wrote an article about it, called "The Radio Kinema." This was published in a weekly paper dealing in matters concerning the cinema, and it made Baird's work known in just the places where he wanted to make his mark.

At about this time, too, Baird had yet another of the frightful bouts of influenza which caused him so much trouble. This held him up for a time; but Hastings, it seems, was a healthy place for him, and he soon recovered. Indeed, he once said that the spell in Hastings, during 1923 and 1924, undoubtedly saved his life.

The article in the weekly paper of the cinema business, however, did one very good thing for Baird. Mr. Will Day, a businessman with wide interests in the entertainment industry, read the article and was very impressed by what it said. He wrote to Baird, they met, and as a result he paid Baird £200. In return for this, Baird granted him one-third of all profits which the invention might make. This £200 was, indeed, what saved the whole enterprise from ruin. If it had not come, the experiments could not have continued, and Baird would have been forced to turn to something which would lead to quicker financial results.

It was at this time that the accident took place which nearly caused the death of the inventor. He sustained an electric shock when something like two thousand volts hit him. There was, too, a tremendous flash of light, and the papers duly reported it as an explosion in a Hastings laboratory.

The man from whom he was renting the room in Queen's

Arcade was understandably worried about this. He wrote to Baird telling him that these dangerous experiments must stop at once. Otherwise he would have to give up the room.

Baird took no notice of the letter, but just went calmly on with his work. But in a few days Mr. Twigg, the landlord, came down to see what was happening, and got very annoyed.

"I told you that no more experiments must go on here," he said. "This nonsense must stop at once!"

Baird retorted: "I am paying you rent for these premises, and what I do here is my business."

They had gone from the upper room down to the street while this argument was going on, and Mr. Twigg became more and more annoyed and more and more emphatic in pointing out that he could not allow dangerous work to go on there. A small crowd had assembled, and Baird thought this was an undignified brawl in which to get involved.

He therefore put his hands in his pockets, turned abruptly away, and stalked towards the stairs. He was surprised when he heard the bystanders burst into loud laughter. He had put his hands into his pockets with such force that he had split his trousers! It was a silly end to a silly episode.

But Mr. Twigg had, in a way, right on his side. He got his solicitors to write to Baird, giving him notice to quit the room in which so many of his experiments had been done.

There was no way of getting out of this, and Baird therefore had to give up the room. He thought that, as he was now in better health, he might as well leave Hastings. Now that he had some connection with Odhams and the trade journals which they published, he thought that it was time that he moved to London, where he could keep in closer touch with all the possible people who might help him or give him the sort of publicity that he needed.

He had enjoyed his time in Hastings; those months had brought him quite close to what was to be his real claim to fame. The days of selling soap and jam were now over. It was to the idea of television that he was tied, and was to remain tied for the rest of his life.

So he moved to London without any real regrets. But Mr. Twigg did not quite have the last word. A few years later there was unveiled on the wall of that shop in Queen's Arcade, Hastings, a plaque which read: "Television first demonstrated by John Logie Baird from experiments first started here in 1924."

Baird himself was present at the ceremony when this tablet was unveiled, and by then—it was in 1929—was well established in the public eye as the pioneer in a completely new field. If Mr. Twigg had any comment to make on the tablet in the wall history has not recorded it!

CHAPTER FIVE

MORE PROGRESS

THE John Baird who came back from Hastings to London in 1925 was a very different person from the John Baird who had departed for the South Coast only two years before. He had not much more money, it is true. But he now had a real purpose in life, and he had succeeded in interesting people in his ideas. Moreover, he was slowly making a reputation. This was in the main due to the articles on his invention which were appearing from time to time in the papers.

He had some disappointments, of course. He managed to get an interview, for example, with a high-up official of the famous Marconi Company, which had been manufacturing radio sets for several years. He said afterwards that the interview lasted just about half a minute. According to Baird himself, it went like this.

He was shown into the great man's office. "Good morning," he said.

"Good morning," said the man behind the huge desk.

"Are you interested in television?" Baird asked.

"Not in the slightest. No interest whatever."

That concluded an interview which Baird had hoped might lead somewhere!

However, he plugged on at trying to improve the primitive television sets which he had first evolved at Hastings. He had now got lodgings at Ealing, for which he paid the

princely sum of eight shillings a week. He had to cook his own meals on a gas-ring in his bedroom, but in this way he would save a little money, though he thought that it was an awful waste of time. When he was frying eggs and bacon, he felt that the time he was spending on this necessary task might otherwise have been devoted to experiments.

He tried to get more publicity in the papers. He knew that this was perhaps the most valuable thing that he could do, for if he could only get people talking about television, as a possibility, then he would be within sight of success. He knew that much time and money were still necessary; but to get the money in particular he needed to get the attention of some wealthy men who were prepared to take a chance and back him up.

He had one minor stroke of luck at this time, however, in spite of the fact that some newspapers thought that he was quite mad in suggesting the pictures could be sent out by radio. The stroke of luck came through the interest of a man who had visited Hastings, and had seen some of the early work that Baird was doing there. This man was a friend of Gordon Selfridge, the owner of the famous store in Oxford Street, London. He talked to Mr. Selfridge about it, and the head of the great firm wondered if this might not provide something of a sensation.

Selfridge's, each year, had some special display as a sort of birthday party on the anniversary of the store's original opening. So Mr. Selfridge wrote to Baird and asked him to call. When he arrived he was asked if he could provide a demonstration of television to the customers.

"Certainly," said Baird. He probably sounded a good deal more confident than he felt, for there was a good deal of hit-and-miss about his experiments as yet.

"Three shows a day?" Selfridge asked.

"Yes."

"Three shows a day for three weeks?"

"Yes."

This was certainly a chance, Baird reflected, to show off his invention to a large number of members of the ordinary public.

"I'll give you £20 a week for three weeks, if you can produce satisfactory results," Mr. Selfridge went on. Baird would willingly have done it for nothing. The chance to show what he was doing to the public was something too good to miss, after all.

Yet, naturally, he did not refuse the payment. He was getting hard-up again, and the prospect of earning £60 was something that he did not want to miss.

The three weeks was a period of great strain. Baird's apparatus was not really constructed solidly enough to stand up to the use involved in three shows a day, six days a week. He had rigged up an arrangement of funnels, down which the spectators looked. They were able (if they were lucky) to see the outlines of objects a few yards away, transmitted by radio. It was not wholly satisfactory; but it did show that Baird was slowly feeling his way towards better results. And there were long queues of customers lining up to peer down the funnel. Mostly they were shoppers who were curious to see something of this latest marvel of science. But there were a few scientists and radio engineers who had read something of what Baird was doing. They came, since this was the first time it had been shown in public.

The strain of these daily shows made Baird ill, and once more he had to have a spell in bed. But just after he had recovered, he had another real stroke of luck. A representative of a firm making electric batteries called on him, and asked if he wanted any batteries.

"I certainly do," Baird said. "About two hundred pounds' worth."

The visitor looked surprised.

"And I can't afford to pay more than about £10, so I suppose I shall have to carry on somehow without them," Baird said bitterly.

A few days later, much to his surprise, he got a letter from the head of the firm, saying that they knew a pioneer never had much spare cash in the early days of his work, and that they were prepared to make him a present of some batteries to the value of £200!

A little later on another firm presented him with about two hundred pounds' worth of valves! He was getting on. And two cousins, impressed by what he was doing, advanced him £500, to help him on with his work. He was therefore no longer quite so much worried by shortness of funds.

Now was the time, he considered, to try to build up and consolidate what he had begun. Up to this point his business had been virtually a one-man show. He had done all the donkey-work of research; he had made all his own apparatus; and he had tried out many ways of raising funds. He was dogged by perpetual bad health, and he had suffered from the strain of doing everything himself.

But now he was joined by another man, who for a time took a great deal of the weight of work off his shoulders. This was Captain Hutchinson, the lively Irishman who had been Baird's rival (and later partner) in the soap business. He had read something of what was going on in the world of television, and he was sure that in this Baird was doing something that would sooner or later make a lot of money.

Someone said that a partnership between an Irishman and a Scot is sure to founder; but these two got on together very well. Hutchinson thought that Baird was a rare genius (as

indeed he was). And the Irishman more or less made it his job to protect Baird and to put him on the map.

They were very different in their way of looking at things, and this sometimes led to heated arguments. Hutchinson thought that Baird went at things too fast, that he saw too far ahead. Baird thought that Hutchinson was far too cautious and not ready enough to take a chance when there was a reasonable possibility of success in some new scheme.

For example, Baird now was sure that his idea of transmitting pictures by radio was successful. Indeed, he had shown this, both in his own workshop and (rather less satisfactorily) to the customers of Selfridge's. He thought, therefore, that it was now time to publish these results, to tell the world just how he had done this.

Hutchinson was less sure. He thought that if Baird revealed his methods to the public, some better business man would pick his brains.

"Suppose," Hutchinson said, "someone else gets one of the big radio firms to back him. Where would you be then?"

"Rubbish!" Baird snapped.

"It's not rubbish, I tell you. The big firms have got big money. They could run you right out of the market in a few months, if they put one of their research teams working on it."

"But how can I get anywhere, unless I show it off to some scientific authorities?" asked Baird. "I can go on tinkering away here, and getting an occasional mention in the papers. That might go on for years. I've *got* to make television known somehow, and if that means a risk that someone will try to pick my brains—well, that's a risk I've got to take."

"You'll regret it," Hutchinson prophesied; but Baird would not listen.

In the end they came to a compromise agreement about

all this. The Royal Institution in London includes among its members many of the most eminent scientists in many different fields. Baird suggested that he might perhaps be allowed to give a demonstration to them. *The Times* would be asked to attend and report on the event; but the more sensational of the popular papers would not be invited.

It was on January 27, 1926, that this demonstration was arranged to take place. About forty people attended, among them some of the most famous scientific experts of the day. Baird at this time was living in Soho, and his laboratory was up three flights of stairs, at the top of a high building in Frith Street. Two tiny attic rooms housed his apparatus, and he was slightly amused at seeing these great men, many of them with their wives and most of them in full evening dress, struggling up the stairs.

The room was so small that not more than half a dozen people could be got in at one time; so they had to come in relays, the later arrivals waiting on the stairs outside.

The demonstrations, on the whole, went well. One old gentleman got his long, white beard entangled with one of the revolving discs. But there were no other disturbing incidents. Baird rejoiced that all went well. And what pleased him more than anything else was to hear one well-known scientist quietly tell another that this was the solution of the problem of television. "All the rest," he added, "is a matter of L.S.D."

This, of course, was what Baird himself had been thinking for a long time past. He was improving his apparatus all the time; but he was meanwhile earning nothing at all. And, in spite of the generous gifts from various firms, such as those already mentioned, he was still spending a lot of money on new items of electrical equipment. These were by no means cheap.

By now he had been completely gripped by the idea of television. He thought of nothing else from morning to night. He even begrudged the time that he had to spend on sleep, for this meant some hours every night away from his experiments. But he knew that he must not lose sleep, for he was still in poor health at intervals. And if he ruined his health by working too hard, that would do nothing to help him towards the results for which he was looking.

It had, at any rate, been a stroke of genius to ask *The Times* to send a reporter, but not to extend this invitation to any other paper. *The Times* has always been a sober, serious paper; and when it reports something it is taken seriously by all its readers everywhere. The reporter certainly paid due tribute to what Baird was doing, and suggested that this was the beginning of one of the most exciting inventions of the century.

Within a day or two there was a queue of reporters from all the newspapers in London waiting on Baird's doorstep. He received them in a kindly way and told them something of what he was doing.

He knew that ordinary journalists, reporting the news items that had to be covered day by day, could not be specialists in science or engineering; and so he did his best to explain what he was doing in the simplest possible terms.

What pleased him more, however, was the articles that appeared in various scientific journals. There were, too, some scientists who had attended the demonstration, and who now asked if they could come back and have a private view of what Baird was doing.

He had, of course, only got part way towards success, and he knew this quite well. He could transmit images by radio. He had not yet got movement on the television screen. His television was like the work of a magic lantern in a village

hall. What he was aiming at was the moving picture comparable with that of a cinema.

There were criticism of his work. Some of the magazines which dealt with radio supported his claims; others attacked him. But this did not really matter very much. The main thing was that he was no longer ignored. As long as people argued about television and the work that Baird was doing on it, he was happy—and so was his colleague Hutchinson. Publicity is the lifeblood of an inventor. What kills a new invention stone dead is when no one speaks of it, and it is never mentioned in the papers. Baird had been treated in this way in the past. But these days were now over.

He had some rivals: There was, for example, an American company which had been working on television, and they put on exhibitions in the United States; but not, Baird pointed out, until April, 1927, about a year after he had given his own demonstration to the members of the Royal Institution.

There seems, however, in all fields of science, to be a time when a particular idea is "in the air," and then a number of people work on the same kind of idea at the same time. But in all these things, there is usually one person who is the real pioneer, and the others are only rivals. It is George Stephenson who will always be remembered in connection with railway engines; it is Lord Rutherford who will always be remembered in connection with our knowledge of the atom; and in the same sort of way it is John Logie Baird who will be always remembered in connection with the development of television, even though, as we shall see, he was disappointed in many of his hopes.

The publicity that he got in 1926 and 1927 helped him very much at the time, though some of the more sensational papers gave him small pleasure in the way in which they re-

ported things. He did not like having his television set labelled a "magic eye," and he was not happy when one newspaper printed an account of his work under the headlines: "Magic in a Garret." But papers sometimes want to make a news-story sound rather romantic. And the television story was the kind of story that seemed to ask to be written up in this way.

There was one well-known scientist who came and asked to be given a demonstration. Baird began to get the apparatus ready. Baird had to leave this gentleman alone in the laboratory while he went out to get some small piece of apparatus that was needed. When he got back he saw the old gentleman lying on the floor, peering up at the back of the television screen.

John Baird wondered what was the meaning of this. He expressed his surprise. The old man said that he had been asked by a group of scientists to investigate Baird's claims, and of course he had to make sure that there was no trickery involved.

Some people, indeed, accused Baird of having a small boy hidden in the box behind the receiving set. The suggestion was that this boy would switch on a light at the moment that it was required.

To begin with, of course, such accusations were bound to be made. Something as new as television is bound to be looked upon with some doubts. And Baird's scheme was so revolutionary that a lot of people felt suspicious about the way he achieved his results.

Not that his set would be thought very exciting by present-day viewers. His screen was only about seven inches wide by three inches high. When he thought that the really convincing demonstration would be to transmit a recognizable human face, he worked out how many strips of light would

be necessary for this. The experiments that went on so long and cost so much, indeed, were for the most part experiments on the number of strips needed for a reasonably clear picture. Nowadays as many as 625 are used; Baird used only thirty.

The other trouble was the inevitable flicker. Baird found that the more detail he got in his picture, the more flickery the picture tended to be. This, of course, had been the trouble, too, with the pioneers of the cinema, years before.

The early work, as we have seen, was mainly in the transmission of things like crosses—images easy to identify. But Baird knew that this was not good enough. First of all, he had to try to get a picture of a human face on the screen. The screen could then be photographed.

The first sitter, when Baird thought he had managed to get the picture clear enough, was his friend Hutchinson. He sat in a chair, with a tight frame like a vice holding his head absolutely still. Any movement would have blurred the picture. One of London's most famous photographers was called in to take a picture of the screen, with Hutchinson's face on it.

It was a long and boring business, especially for Hutchinson, who had a horribly stiff neck after sitting there for what seemed an age, with his head tightly clamped in position.

In the end, however, a satisfactory photograph was produced. This was something which made television history. The picture was widely printed in the papers, and Professor Andrade, a very famous scientist indeed, wrote an article on television, praising very highly the work that Baird was doing. This was printed in an encyclopedia.

By this time Baird realized that there were two ways in which he could break down opposition and beat his American rivals. He had to get as much publicity as he could, and

he had to carry on with the demonstrations, so that as many people as possible saw that he really had started something that was worth while.

Then he had another idea. The light which we see is really confined to a fairly small range. There are light rays to which our eyes are not sensitive—what are called the infra-red and the ultra-violet rays. These cannot be seen by the human eye; but a television receiver would be sensitive to them. Why not have a subject sitting in darkness, with infra-red light on him? Then this light could be sent to a receiving set, which would turn the electrical impulses back into light. But the light at the receiving end *would* be visible. Then in effect what would be happening would be someone sitting in darkness, and his picture would suddenly spring up on the small screen of the receiving set.

Baird always seemed to be working in this way, on two or three schemes at once. It was not long before this so-called "seeing in the dark" was working perfectly well. The picture at the receiving end was just as good as that in the more ordinary sets.

The Royal Institution members were again invited to climb the stairs and see the new marvel. Among those who came was Sir Oliver Lodge, himself a pioneer of radio.

Sir Oliver agreed to sit as a subject, in order to have his picture sent "over the air." He said that it was amazing, but very hot! This is not very surprising, since infra-red rays are those which carry heat from one place to another. However, Sir Oliver's picture came over very well indeed. He had white hair and a white beard; and contrasts of this kind naturally stood out well on the flickering screen.

Again this was reported by the papers in the most sensational way. It was a new scientific marvel at a time when many marvels were being reported.

CHAPTER SIX

PROBLEMS OF FINANCE

ONE of the difficulties of an inventor like Baird is very different from the problems of a man who discovers a new drug or a new type of medical treatment. Television was quite clearly something with a great future; but to develop it was a very expensive process. Baird, as we have already seen, had little money in the early stages. All he had was a great faith in the future of his invention, and an abiding interest in making it as perfect as it well could be. He had some strokes of luck, such as the gifts of batteries and valves. But at the same time he had to face the fact that permanent backing in cash was necessary. And where was this to come from?

Also he had to realize—he did, indeed, realize—that it was very impressive to send his pictures from one side of a room to another. But in order really to convince the world he would have to send his pictures over a much greater distance.

Would the B.B.C. help him, he wondered? He decided to try. After all, if he could get even the momentary use of one of the great radio stations of the B.B.C., then he would be able to make a demonstration that no one could either argue against or ignore.

As always, he got in touch with someone whom he thought likely to help him in his new ideas. In this case it was Mr. Kirke, who was chief engineer to the B.B.C. Mr. Kirke had already heard of what Baird was doing, and he was very much interested in the idea of sending a picture over a greater

distance than had previously been thought possible. He promised Baird that he would do his best to provide whatever the B.B.C. could do in the way of using their transmitting stations.

What was done at first was to send a television picture by telephone from Baird's laboratory in Soho to the B.B.C. studios. The B.B.C. then sent this out through one of their aerials, and Baird received it back in his Soho laboratory on the receiving set. This was towards the end of 1926. It was a complete success. What went through the telephone was, of course, a series of electrical impulses, which really amounted to a picture turned into electricity by Baird's usual system of spinning discs. Then they could be turned back into a picture again at Baird's receiver.

It was a triumphant justification of all that John Baird had been doing now for many months. But the B.B.C. was a public organization; it was not supposed to allow its apparatus to be used by a private individual. And, as Baird's later friend, Sydney Moseley, pointed out, the need for secrecy meant that one of Baird's most satisfactory demonstrations could not be made public.

Yet it made Baird a very happy man. He was now more sure than ever that he was working on the right lines. But still there was the eternal problem of raising enough money, to make his television sets more perfect.

It was in that year of 1926, too, that he decided his Soho premises were far too small and cramped to house the more and more elaborate sets he was building. The fact that the B.B.C. had more or less sworn him to secrecy meant that if he was to go on with his efforts to send pictures over a distance he would need to have two laboratories, situated some distance from each other. Then he would be able to send out his pictures from a transmitter in one building and receive

them in another building, some distance away. This too meant money, but it was money that he felt he had to spend.

He took a room in an office block near Leicester Square in the centre of London; he also fitted up a receiving station in a house in Harrow. These two were not many miles apart. But they were sufficiently far to enable him to do what he needed in the way of transmission over a distance. Gone for ever now were the days when he sent a picture for a few feet only, from one side of a room to the other.

Hutchinson thought that he could help Baird in many ways—not least in helping him to raise money. He introduced him to a financier who was most impressed by the claims of the television pioneer. This man inquired how much money would be needed to really put television on the market in the way in which radio or the gramophone was on the market. Hutchinson, thinking that it was not of the slightest use being modest about this, said that it would be in the region of £50,000. Baird whistled softly as he heard this remark. He had never thought in those terms. Two or three hundred pounds was the sort of figure he had been thinking about. But the financier did not worry when £50,000 was mentioned. People who do business with big firms know that this kind of sum is the money needed for any great new idea.

A company was, indeed, started, with a capital of £100,000, and with a man who was a director of Daimler cars as chairman of the directors. Baird and Hutchinson were, naturally, appointed directors.

It would now have appeared that the troubles were over. The directors got sizeable salaries; the money was available for buying even the most expensive of apparatus; and for the time being Baird felt that he was at last in a position to get on with his work without a worry in the world.

There were afterwards (as there often are) more financial arrangements, when a new company called Baird International Television Co. Ltd. was launched. This was partly because, though Baird had patented many parts of his apparatus in Great Britain, it was realized that it would be necessary to patent them all over the world. This was to ensure that no foreigner should steal Baird's ideas and start making television sets without permission from the original inventor.

Baird was puzzled by a lot of these business arrangements. He was not really a businessman, as his efforts with soap and socks had proved. Now and then he might have a "hunch" which would pay off; but for the most part he had an inventive brain which would work out wonderful ideas. It was up to other people to take his inventions and sell them. This, indeed, applies to many great inventors. The man who works out an idea is all too rarely the man who makes a profit from it.

However, it appeared as if he had now got the right kind of cash backing, and that the days of his struggles against poverty were over.

Both Baird and Hutchinson were given a number of shares in the company that was formed. They did not have to pay for these shares, of course. The shares were regarded as a kind of payment for the fact that early work on television was handed over to the company.

Later a big businessman, who saw the possibilities of television, wanted to buy the shares that were owned by Baird and Hutchinson. He offered as much as £125,000 to each of the two men.

Hutchinson, who now had perhaps exaggerated ideas of the value of television at this early stage, said: "Do you mean £125,000 a year?"

Baird looked staggered at the amount of money that was

being offered, and said that he couldn't accept, for if he had all that money he just would not know what on earth to do with it!

So the proposed deal fell through, though the reasons why the two men refused were very different. Maybe the difference in their reasons gives some explanation of the contrast between them.

Certainly this shows that Baird was a very modest man, and not a man who was trying to make vast sums of money out of his invention. He wanted, too, to hold on to his shares because he thought that if there were arguments as to the future of television he would have a good deal of say in what was to be done. A shareholder, after all, is allowed to speak and to vote at meetings of the company; and as Baird was really the founder of the firm, it would have been silly if he had had no say in its affairs.

One of the troubles that arose, almost at the beginning of Baird's company—indeed, almost on the day when shares were offered to the public—was that an American company came out with a demonstration. This, which took place in New York, was with a system different from Baird's. It might have caused a complete failure of Baird's company. The public might have refused to buy the shares. It had appeared, when Baird first arranged with the financial experts to have this company floated, that he had the only workable television system in the world. But now some Americans had shown that his was not the only way in which a television picture could be made to appear.

Readers who have studied the lives of great men will feel, when they compare Baird with some men, that he was unlucky. There are others who have produced something—say Sir Robert Watson-Watt and his radar—and who find that it is plain sailing when once the first idea has been worked

out. With Baird it was never plain sailing. In his early days he struggled with poverty. And when he seemed just about to step into the really big money, opposition appeared.

One French scientist who had seen Baird's work in London, also witnessed the American demonstration. He agreed that, while the Americans had not stolen any of Baird's patents, they had in some degree followed in his footsteps, and used a method that was not really as different from his as had at first been thought.

Baird thought that this was a narrow squeak. It might even have meant that the launching of Baird Television as a public company would have to stop. But the experts on finance decided to go on with their plans and Baird could breathe again.

One interesting point about this company was that it really depended on the inventive genius of one man—Baird himself. Television was such a new thing that few people knew very much about it. Even the handful of men who had worked with Baird were for the most part skilled electricians under his control. He had to tell them what to do; and the ideas for improving reception were his ideas.

What, the financial wizards asked themselves, would happen if Baird fell under a bus? What would happen if he caught some deadly disease and died? The shares of the company would at once be almost worthless. There was only one thing to be done, to safeguard themselves against anything of this sort happening. The life of John Logie Baird would have to be insured—and it would have to be insured for a colossal amount.

The doctors who worked for the insurance company were doubtful. With Baird's long history of bad health he was not the sort of man whom an insurance company calls "a good risk." Although he was still only middle-aged, the chance of his living to a ripe old age did not seem very good. In the end,

however, the insurance company agreed to insure his life for one year for no less than £150,000! This was, it was thought, at that time the highest insurance policy on the life of a human being that had ever been placed. Some film-stars were later insured for more, when a very expensive film was being made. But this policy on Baird's life cost the company £2,000. Even that premium covered one year only.

Hutchinson's life was also insured for a large amount, even though he was more in the nature of a business manager than an inventor.

It was at about this time, too, that Baird met a man who was to have much to do with handling the publicity side of television in the years to come—a journalist, Sydney Moseley, whose book *John Baird: The Romance and Tragedy of the Pioneer of Television* was later to tell the world a lot about Baird and his ideas. Indeed, Mr. Moseley's book, which was published in 1952, after Baird had died, contained much from Baird's own unpublished writings. It is a book which will naturally be referred to by everyone who wants to get the facts about the life of a very remarkable man.

Mr. Moseley was a leading journalist. Many journalists had tried to get into their papers something of the romantic story of television. Mr. Moseley was perhaps the first to seize to the full, the chance to get this new thing known to the public as a whole; and not just to those who read the scientific and technical magazines and journals.

One of the radio journals had made what Baird regarded as an attack on his company; and as soon as he knew that Mr. Moseley was connected with the firm that published this paper, he thought that this was a chance to get a reply.

"Can you fix it?" he asked.

"Not 'fix' it," Moseley said, "but I can investigate it, and try to get the facts published."

This was done. The facts were established, and what Baird had regarded as a slur on his name was righted. Mr. Moseley, from that time on, became a firm friend of Baird. As we shall see in the later part of this book, he had much to do with putting the Baird system of television firmly in the public eye. Baird was always grateful to him for this.

There was now developing a kind of antagonism between Baird and Hutchinson. It is not easy to see just what was the trouble. But the two men, while they had worked together in quite a friendly fashion for a good time, were very different in the way in which they looked at things.

Some of the arguments that developed were about small things. When the company was started, for example, it was to be called "Baird Television Ltd.," which sounded fair enough, since its job was to put Baird television sets on the market. But Hutchinson wanted it to be called "British Television Ltd.," as he said they might perhaps want to buy other patents by other men. Baird felt very strongly that his own name should be in the name of the company. This was understandable. The argument went on for a good while. It came to a head when Baird came into the office and found that Hutchinson had actually ordered some notepaper, with the printed heading "British Television Ltd."

Baird threatened to withdraw altogether from the company if this was its name. That stopped the idea of the change in name of the firm. But it meant that there was likely to be trouble.

Baird was something of an individualist. He had no connections in the business world. He knew, really, that if he did not somehow continue with this company he would be plunged right back into the poverty-stricken struggles which had been so heart-breaking in the past.

He was indeed fortunate that Sydney Moseley had come

into the picture. For Moseley had great faith in Baird's genius. He had, too, the support of the papers. Moseley knew most of the leading journalists of the day. He was sure that he could do much to put Baird and Baird's television right in the centre of the news. In the end he was asked to join the Board of Directors of the company, and agreed to do so.

Baird was delighted. He knew that this jovial man was just the sort of person he wanted to help him with his future plans. He thought, too, that Moseley would help to fight off the opposition that seemed to be coming from Hutchinson.

It was, really, a very sad affair, that the directors of this very promising firm threatened to split into two rival camps.

Baird himself thought that Board Meetings were a waste of time. His job was to develop television. And on more than one occasion, when the directors were discussing some problem of finance or advertising, Baird was sitting in his chair, fast asleep!

Hutchinson, on the other hand, quite enjoyed these discussions, and probably thought that Baird was merely pretending to be bored by the arguments about details.

Few inventors have been good businessmen; and Baird was certainly one of the most unbusinesslike of people. He thought about nothing but television all day long. He once said that he ate, drank, and slept television. The arguments about minor items of company affairs seemed to him to be matters of no value and importance.

Baird was asked to sell some of his shares in the company. He refused point-blank. It appeared that he feared that Hutchinson was trying to get control of the company, by buying up shares from other people. This was quite an unjustified suspicion. But the fact that he could think along

those lines was enough to make Moseley's task a difficult one. To keep the peace between two men so different is never easy.

Moseley did a lot to make television known. One day Baird and Hutchinson told him that they were very grateful for all he had done, and they wanted to do something to show their gratitude.

"All right," he said with a grin. "Give me some shares—both of you!"

They promised to do this. But, as Moseley himself wrote, this went no further than a promise. Later on they promised again. But the shares were not handed over. Moseley said that he thought that each of them was scared to make the first move.

Moseley did, indeed, in the end get some shares. But he had to get a stockbroker to go to the Stock Exchange and buy them for him at the official price.

All this is rather strange reading, in the life of a great inventor. And the fact that John Baird got so involved in the manoeuvres of Stock Exchange transactions is probably one of the reasons for his unhappiness.

Many a time he regretted not having accepted that offer of £150,000. If he had allowed himself to be bought out, he would have had enough money to live on in great comfort for the rest of his life, and he would have been spared much worry and much unhappiness.

One of the wireless journals at this time issued a challenge. It offered £1,000 to Baird if he could put on a satisfactory demonstration of television. This may seem strange, when one recalls that Baird had already shown his own early sets to many people, including a group of scientists from the Royal Institution. But the paper laid down certain conditions that would have to be satisfied before they called it a

satisfactory demonstration. Some of these conditions Baird thought it would at the moment be impossible to fulfil. He told Moseley that he felt this paper was trying to kill his invention.

"I think that I can make them print the facts," Moseley said.

"Nothing you can write will offset what other people had been writing about me," Baird replied. He was very bitter, because some papers had hinted that he was claiming far more for his invention than was really justified.

Of course, the television sets of those early days were very primitive compared with what was normal years afterwards. But there was no doubt that Baird had already produced results, and that the results were getting steadily better as time went on.

But it is not surprising that he became very much annoyed when papers sometimes suggested that he was not really capable of getting the results that were needed. He *knew* that the results would come. He was still puzzled about some aspects of his odd-looking arrangement of spinning discs and the like. How to overcome the flicker? How to make the picture clearer? These things still worried him. And how to get a bigger picture without losing clarity? That was another. But all these problems did not for a moment make him depressed or despondent. He thought about them day and night; and he was sure that he would sooner or later get them settled.

Baird at this time was almost living the life of a hermit, save that he spent time with his colleagues in the laboratory. He never went to a theatre or a concert. He scarcely read the newspaper, though he sometimes looked hurriedly through one, to see if there was any reference to television. He became more and more forgetful about his appearance, so

that he was sometimes seen striding along the street, wearing odd socks and shoes.

When the £1,000 challenge was published, however, he was more upset than he had been for a very long time. He asked Moseley what he could do. He gave Moseley himself the first lengthy demonstration of television that he had enjoyed. And Moseley agreed that this was the beginning of what would in the end prove a modern miracle. But it was only the beginning. "You have not put over a perfect picture," Moseley told him, "but you have certainly made a start."

"Can you write an article about this, and get it in the paper, in reply to their challenge?" Baird asked eagerly.

"I'll do my best," said Moseley. "And it will be an honest assessment of what I have seen here."

The article duly appeared. The editor, not wishing to seem to lean too far to one side or the other in this argument, decided that he would use two articles in one issue of his paper. Sydney Moseley's article was a statement of the case from Baird's point of view. On the opposite page was an article in reply, written by P. P. Eckersley, who was one of the leading engineers in the B.B.C.

This was quite fair. Baird was very pleased at what had happened. No longer could he say that he was, in a sense, being frozen out, for now he was getting space in a very important magazine, and he was not just being attacked. A defence was allowed as well.

Hutchinson was pleased too. He had said that they would stop demonstrating their sets until these were much improved. But he knew that to answer the £1,000 challenge almost anything was justified.

CHAPTER SEVEN

ENTER THE B.B.C.

ALL the time that these financial arguments were going on, Baird was still experimenting. He begrudged every hour away from his laboratory, and was trying to work out many new ideas, even when the old ones had not been perfected. Colour television—was it possible? Stereoscopic television, when objects would seem to stand out from the sheer flatness of the background—could this be brought about? These questions flashed through his mind, and he spent long periods in puzzling about them.

It was perhaps the one weakness of Baird as an inventor that he had too many ideas. The most successful inventor gets hold of one promising idea, and works it out to a satisfactory end before turning to something new. Baird was inclined to have two or three schemes in his mind at the same time.

It was in 1927 that he began to experiment with colour television. This he hoped to achieve by means of revolving discs as before. But there were three series of holes. One set was covered with a transparent red filter, one with green, and one with blue. Three different pictures were thus produced, and these were recombined in the receiving set.

Some sort of coloured picture was obtained, and Baird was encouraged to persist with these experiments. The picture was, however, very tiny, being only about an inch square. Baird was glad to demonstrate this at the meetings of

the British Association for the Advancement of Science. He was the more delighted in that the British Association met in Glasgow that year, and he was thus in a sense back on his home territory for the job.

His original system of television was now more and more recognized as a definite success. A Television Society was formed, to study possibilities and help in future development. A leading member of the House of Lords, Lord Haldane, became its first President. Many people occupying high positions in the land became interested, no doubt in part through the brilliant publicity now being organized by Sydney Moseley. The Prime Minister, Ramsay MacDonald, had a television set installed at No. 10, Downing Street. Baird had joined the Caledonian Club, a club for London Scots, and one day he was terrified when he was asked if he would give a demonstration of television there. The cause of his terror was that he was told that this was to be done at the special request of the Prince of Wales (later King Edward VIII), who intended to be present.

Like most pioneers, he was always a little scared of the special occasion, fearing that something would go wrong. Nothing went wrong this time, and he was warmly congratulated by the Prince when the demonstration was over.

Yet, in spite of the attention that his invention was now receiving, Baird felt more and more that the next great step would be to interest the B.B.C. in the possibilities of television. Some of the leading personalities on the technical and engineering side of the B.B.C. had already shown their interest. But the Corporation had not been officially approached.

Whether Baird had hopes because the head of the B.B.C. was a fellow-Scot is not known. Indeed, Sir John Reith (as he was in 1927) had years before been a fellow-student of

Baird's in Glasgow. Baird had always been a little in awe of Reith. This was partly because of Reith's great height—he seemed to tower above Baird. It was probably in part due to Reith's brilliance as a student, whereas Baird had been a very average person in his student days.

At all events, it was time that some sort of official approach should be made to the B.B.C. If they could be induced to put out even very brief but regular television programmes, then the future of Baird's company would be assured. It was not easy to sell television sets at a high price while the whole thing was a kind of toy, and when pictures could be seen only at rare intervals, when Baird and his friends decided to send something out.

The real trouble was that the B.B.C. was the sole body in the land which had permission to send out radio transmissions on anything but a tiny scale. And large organizations are liable to be rigid and unyielding, when faced by something quite new. Baird himself was not good at what are now called "public relations," in that he was a rather shy and diffident man. He was in his own mind very sure that he had something with a very great future. But he found it very difficult to put this over to strangers. He was, in fact, very reluctant to talk to strangers. When he was given the task of showing off his invention to new people, he was quite prepared to do this, but he would let the invention speak for itself, and was not ready, as a rule, to talk at great length about it himself.

So it was perhaps a fortunate thing that he now had, in Sydney Moseley, a man who was quite prepared to go out and battle to get some sort of co-operation from great bodies like the B.B.C.

Moseley saw the Postmaster-General, who was the member of the Government responsible for broadcasting develop-

ments. He was very interested to hear what was being done by Baird and the company, and promised to discuss the matter with the leading people in the B.B.C. However, the B.B.C. had always been in a way quite independent of the control of Parliament, so all that the Postmaster-General could promise was that he would see if he could persuade them to see Baird and to examine his claim to have a satisfactory system of television.

This was at any rate progress. And meanwhile Baird was trying to get clearer and bigger pictures. He knew that people would not be happy with a very small picture on the screen. They were, after all, accustomed to going to a cinema, where they saw a huge picture, many feet across. A screen only a few inches in width would not seem very impressive to most people.

It was, of course, understandable that the B.B.C. had to be very careful. No doubt they had many people trying to sell ideas to them; and they would not undertake anything new until they were quite sure that it had real value, either to entertain or to educate people. Mr. Gladstone Murray, who was one of the technical staff of the B.B.C., was given the job of examining Baird's claims, and seeing if there was any likelihood that the new idea of television could be somehow fitted into the ordinary routine radio programmes which were now going out for many hours every day.

Now, some forty years later, with B.B.C. television so much a matter of everyday experience, it is not easy to understand the reluctance of the Corporation to do much in the late 1920s. But all the same, it must be understood that Baird's invention was by no means perfect. The pictures still flickered quite a lot. The outlines were not always as clear as they were later to become. And one can understand that, since sound radio reception was very good indeed,

some members of the B.B.C. staff thought that to plunge into this rather doubtful invention of television would be a mistake. They wanted to wait until pictures could be sent out as perfectly as the sound broadcasts which had now been going on for some years.

Baird grew very impatient as the long-drawn-out negotiations with the B.B.C. went on. He could never understand why things could not be made to move more quickly. Moseley sometimes had great difficulty in keeping him quiet. Baird was all for rushing into matters, and trying to force the issue. Moseley counselled tact and a quiet approach. He was sure that sooner or later the B.B.C. would be prepared to listen.

In the end the B.B.C. agreed to send out pictures for a short period each day. The pictures were, as was to be expected, of very variable quality, and sometimes they were poor. Television, Baird realized, was still to some extent at the point where weather conditions might have an effect on the kind of picture that flashed on to the screen. Also the transmitters were still too liable to sudden breakdown. It was not entirely satisfactory, though it proved that the claims of the company to have a workable system were in some ways justified.

Baird shuddered whenever something went wrong. Yet on the days when a good picture emerged on the screen, he felt on top of the world. He was a moody man, and was inclined to fluctuate between dismal pessimism and wild optimism. His company, by this time, had attracted not much short of a million pounds from people with money to invest. Surely, he told himself, it was not possible that after all this the whole enterprise was going to collapse in ruins?

The story of John Logie Baird is a story which is in many ways much more tragic than that of most inventors. How

much of this is due to the fact that he was himself rather a shy man, it is difficult to say. Even when he met Lord Reith (as he was later to become) he was so overawed by the sheer power of Reith's personality that he did not do himself justice in the way in which he tried to explain what he was trying to do.

The experiments which the B.B.C. carried out with television pictures by the Baird system had started in 1929. This was, of course, a great step forward. But these pictures were transmitted pretty regularly for some two years. In 1931 it did not really seem that they had got much further forward than they had been in 1929.

Baird had spent those two years in a perpetual suspense. He had meanwhile been plunging ahead with his efforts to produce a coloured picture, and had made some progress in this direction. Yet it would appear that he was wasting some of his energies in pushing this coloured problem on, and not in concentrating on real perfection with black and white pictures. For the B.B.C., while quite prepared to offer him a chance to prove his case, were getting a little impatient that things were not improving very fast.

The television pictures had, of course, attracted wide attention to begin with, while they were still a novelty. But the sets to receive the pictures were very expensive. There were only a few hundred viewers at most, who could receive the pictures; and they began to get a little restive, as they had spent a lot of money on their sets, and could get only a very limited amount of entertainment from the small television screen.

In 1931 Gladstone Murray expressed what was being thought by the B.B.C. when he wrote to Moseley to the effect that surely by now the early experimental work had been extensive enough. Was it not time to launch out and

give viewers something in the nature of genuine entertainment value?

The snag was, of course, that without B.B.C. backing there was danger that the whole thing would collapse. The B.B.C. was the only body in the country that could really put the idea across. And some of their staff were getting more and more doubtful as to whether television was practicable. Or, if they thought that it would one day reach something like the perfection of the cinema, they thought that this would be a long way ahead.

The American company which had been an early rival of Baird, too, was now pressing forward. Baird began to fear that, though he had been the first in the field, he might even yet be beaten on the post. It was all very depressing, the more so in that so many people had invested money to keep Baird television going. Were these people to lose the money which they had invested? This was, in fact, the situation that Baird faced in 1931.

But nevertheless the first experimental broadcast had taken place on September 30, 1929. That was really the most important date in the life of Baird, and in the history of British television. At the time there were less than thirty television sets in the whole country.

It had been a very exciting day, and, as he looked backwards to it from 1931, Baird could not help wondering what had gone wrong. Sydney Moseley had acted as announcer at that first television programme. Speeches were made, and there was a brief entertainment. The screen was only eight inches wide.

One of the snags to begin with was that the B.B.C.'s London station could make only one wave-length available at a time, which meant that the picture had to be shown first and the sound next, so each item of the programme had to be

gone through twice. The programme, indeed, was split up into two-minute sections, first with the picture alone and then with the sound alone. This naturally cut down what one might call the entertainment value. Yet this was in no way the fault of Baird. If two wavelengths had been available, the picture and the sound could have gone out at the same time.

At the time of these experimental transmissions of the B.B.C., Baird was living at Box Hill in Surrey. He used to invite friends to come down and see the brief programmes of pictures and sound as they came over the air. To begin with, as we have seen, he thought that he was really getting television on the map. But the fact that the B.B.C. appeared to get more and more impatient with the fact that progress was not being made got more and more worrying to him as time went on.

Jack Buchanan, the well-known musical comedy star, had taken a main part in the first programme to be broadcast; and over the two years and more that the experiments lasted, many leading figures in the world of the theatre and of music made their appearance on the screen.

Baird himself was quite sure. When the programmes started he boldly said that, while the first programmes would be short and modest, he was certain that the time would come when viewers would be able to watch the Cup Final or the Derby. Some reporters treated this as claiming a bit too much for the possibilities of his invention.

There were, too, as we have seen, many people in the B.B.C. who felt that many years must pass before television came within striking distance of the perfection of sound radio.

What Baird was most anxious about in those early days was that he should be granted the simultaneous use of two

wave-lengths. Only by getting sight and sound together could he provide the sort of entertainment which the B.B.C. would consider really worth while.

After the first transmissions in 1929 he battled with the B.B.C. for this. Not unnaturally the Corporation were not very eager. They saw their task as being that of providing good value on their sound programmes. If they gave Baird the use of two wavelengths, even for a few minutes each day, it would mean that their listening public would be deprived of something during that time.

In 1930, however, the B.B.C. had started a new station at Brookman's Park, not far from London. By this time Baird had a studio in Long Acre, in Central London. Sydney Moseley, as always, was pressing the B.B.C. to do something about it. And finally, when the Brookman's Park station was working, they agreed to allow an experimental programme, with sound and picture going out together. Now, Baird thought, success was sure! Always optimistic when this sort of thing happened, he was prepared to feel that success when in his grasp. All too often it eluded him at the last moment.

Sydney Moseley was aware of the great importance of this occasion—the first time that sound and vision had gone out together. So, as he says in his own account of the occasion, he took great trouble to get together some important people to feature in the programme. They included Sir Ambrose Fleming, the inventor of the valve on which sound radio depends, two singers from the serious stage, Gracie Fields, the popular star of variety, and R. C. Sheriff, the playwright whose *Journey's End* had been a great success.

Moseley himself was, as often, to be the announcer, and he has said that he felt extremely nervous as he faced the microphone.

The picture was on the whole good, and the sound came

over very well. There was some slight defect in one of the B.B.C. transmitters, which caused dark smudges at points. But the various people who appeared in the programme came over very well, especially Gracie Fields, who sang some of her famous Lancashire songs. The reporters who had been asked to watch the programme gave it high praise.

That day Baird's telephone hardly stopped ringing. Everyone who knew of his long period of experiments wanted to congratulate him on the great step forward which had been taken in this linking of sight and sound. Sydney Moseley's sister rang to say that she had received the programme well from twelve miles away. That was a great distance for television in those early days!

R. C. Sheriff, who made a little speech, remarked that if this invention went as well as it seemed to be doing, he could not help wondering if the result would be that people would stay at home instead of visiting a theatre. This, indeed, has been a complaint of both theatres and cinemas in the later years, when television has spread so widely.

This first joint sight and sound play took place on July 14, 1930. It was largely as a result of Sydney Moseley's work that the B.B.C. did it. It triumphantly proved that Baird had been working on the right lines. Even though there were faults, the fact remained that the picture and the sound kept perfectly in step, and that the future of television was very rosy indeed.

It was called *The Man with the Flower in his Mouth*. The screen was, of course, still tiny. There was no chance of having a large number of actors. There were, indeed, only two men—the brothers John and Val Gielgud. Lance Sieveking and Sydney Moseley were joint producers. The play took half an hour. Gladstone Murray, who had long believed in Baird's invention, helped on the technical side.

And the play, while not a great work of art, did come across on the screen reasonably well. Both Val Gielgud and Lance Sieveking, who were notable figures in the sound drama department of the B.B.C., thought that this first experimental play showed that the development of full-scale television plays was only a matter of time.

But again, as Baird thought of this, he wondered just what went wrong, in that bigger and better plays did not swiftly follow that first successful experiment.

Of course, there were many difficult details. They had many experiments, for instance, as to the best sort of make-up to put on their faces, in order that the picture might look natural. But these things were very minor details.

Some B.B.C. officials, however, seemed to feel that the mere fact that it was Baird's system which was being used was in a way an advertising stunt, putting the name of John L. Baird before the public with extreme prominence. Yet it is not easy to see how this could have been avoided, in view of the fact that long and persistent experiments over the years had led Baird to the position where the televising of a play had become a practical possibility. Baird was hurt by what he regarded as an attempt to belittle his invention.

CHAPTER EIGHT

THE BIG SCREEN

ALTHOUGH in this period from 1929 to 1931 the B.B.C. developments of Baird's invention seemed to be stagnating, he was studying various other ways in which it might be developed. He had already produced tiny-screen coloured television pictures. He had also turned his attention to a really massive big screen.

This was, in a way, insurance in case the B.B.C. finally turned down his system, or decided not to proceed with television in any form. This seemed quite likely to happen. If he could not succeed in getting anything permanently established with the B.B.C., Baird asked himself, why not try to get some form of television accepted with the cinemas?

Things had been developing rapidly in the field of television during those last few years. Baird himself had succeeded in improving the size and clarity of the picture; and in the United States, in particular, others were working feverishly to be the first in the field with some new and improved kind of television. There was great rivalry, therefore, among many people. Baird had certainly been the first in the field; but from time to time he was compelled to ask himself if in the end he was not in danger of losing the race to establish television as a commercial enterprise.

The Marconi Company had suggested that it would soon be possible to have a big screen in a theatre or a cinema,

where events taking place elsewhere would be shown to large audiences. Baird had toyed with this idea too; and now he was working at top pressure. He was sure that his system would work; but it meant extremely complicated electric wiring. He had to work out the electric circuits which would give a good picture on the big screen.

In principle it was not all that different from his small screen. But he planned to have over two thousand separate electric bulbs behind a semi-transparent screen. Each of these would be separately wired. But at the same time there had to be a quick-moving machine, which would switch on and off the two thousand lights in such quick succession that they would look like a picture. The result would be not altogether unlike the pictures in newspapers, which are made up of a series of small dots. But in the case of Baird's big-screen television the "dots" would be the electric bulbs.

The idea was simple, like most of Baird's ideas. But the putting of this idea into practical use was very difficult indeed. Yet his early training as an engineer stood him in good stead, and before many weeks he thought that he had worked out a series of electric circuits that would provide the sort of result he was looking for.

Now he had the old problem again. He had persuaded the B.B.C. to give him a certain amount of experimental time "on the air." Who could he persuade to let him have experimental time to show off his new big-screen invention? Clearly it would have to be one of the great theatre or cinema owners.

Once more it was invaluable Moseley who provided the bridge. He saw Sir Oswald Stoll, owner of several London theatres, and somehow persuaded him that this big-screen television was something of genuine entertainment value. It would be at least a novelty.

"Put it on as a trial in one of your theatres," he urged. "No one else will be able to show anything like it."

Sir Oswald was not fully convinced; but everyone who is connected with the theatre knows that a completely new thing is what will draw in the crowds, if it be started in a sufficiently dramatic way.

"Could you make it visible all over the Coliseum?" Sir Oswald Stoll asked quietly.

Moseley whistled quietly. The Coliseum! This was a huge theatre in St. Martin's Lane, in the heart of London's theatre area. If Baird could pull this off, nothing could be better for the future. It was a highly dramatic moment, when he made the arrangements.

Baird had, in actual fact, been thinking about this big-screen television for quite a time. He had patented such a system as long ago as 1923, but had turned aside from the development of it, in order to concentrate on his B.B.C. experiments and his other main idea of colour television.

But now he had it worked out in what he was sure would be a satisfactory way. Maybe, he told himself, if this proved an attraction to the public, it would give him a chance to do something even better than the routine of television via the B.B.C.

By this time there were quite a number of skilled electricians and engineers working with Baird. In the last weeks before the Coliseum show was to go on, they were hard-pressed to get everything in working order. As usual, Baird had everything worked out on paper. He had, too, carried out enough experiments to be quite sure that all would be well. But the actual electrical equipment that had to be put on the huge stage at the Coliseum was complicated and difficult to assemble. He and his assistants rushed about connecting wires and trying out the circuits, to make sure that there

should be no hitch on the great day when the first large-screen television should be shown.

The actual details of the programme were left to Sydney Moseley, who had been given the rather grand title of "Director of Baird Television Programmes." Baird was concerned only with the actual technical side of the affair. He wanted to put a picture on a large screen. Just what the picture should be did not worry him at all. He was content to leave this to the knowledgeable and invaluable Moseley.

Moseley thought that the best thing to do would be to make it a kind of magazine programme, with a number of notable people taking part. He got in touch with a number of eminent personalities and persuaded them to agree. The Lord Mayor of London was one; Bombardier Billy Wells, a famous boxer, was another. Miss Ruby M. Ayres, writer of romantic novels, also agreed to say a few words. Miss Ishbel MacDonald, daughter of a former Prime Minister, was another contributor. Sydney Moseley, indeed, cast his net wide.

The television feature was to be part of a mixed variety programme, with dancers and comedians playing their part on the stage. Sydney Moseley himself was to be the compère or announcer, introducing the various speakers. He has related that when he faced the cameras, knowing that what he was saying should (all being well) be watched by the massed audience in the Coliseum, he wondered what sort of reception he would be getting.

Baird was in the audience. He, too, felt a little nervous. This was, he told himself, something that might make or break him.

Sydney Moseley's introduction came over well—too well, for one member of the audience. Baird told Moseley that a man who had been drinking was taking his seat in the stalls just as the television feature was due to begin. This man

expected to see a group of dancing girls or a comedian. He looked up at the stage—and there was the face of Sydney Moseley, and a huge hand, with a finger pointing at the audience. Moseley had pointed at the camera. The result was that everyone in the theatre got the impression that the finger was pointing directly at him. The tipsy member of the audience was terrified. "I'll never touch another drop!" he exclaimed, and staggered out of the theatre. This was, at all events, Baird's story, as he was later to tell it to Moseley.

The Coliseum was in touch with the studio in Long Acre by telephone. Moseley asked if anyone in the audience would like to ask a question. One man shouted: "Tell him to put his hand up." This request was passed to the studio by telephone, and the hand of the speaker on the screen was duly raised.

Reception was on the whole very good. There was still some flicker, and some lack of clearness in the picture. But as a first experiment in a completely new kind of television the Coliseum show was a complete success, which must have converted many who thought this was a kind of toy, without any really practical possibilities.

One newspaper said: "History was made at the Coliseum." The technical problem had, indeed, been solved. Few people can have been aware of how great a problem, from the engineering point of view, it really was. There were over two thousand separate lamps. They were switched on in rotation: but in order that the eyes of the audience should see something that looked like a complete picture and not just a series of rapidly flashing lights, all these two thousand lamps had to be switched on and off within a period of only one-twelfth of a second. This was because the human eye keeps in view a flash of light only for a very brief moment of time.

Baird, in fact, had done a wonderful job of work, not

merely from the point of view of the television work involved, but in the other field of electrical engineering. If there were faults, they were faults that, he was sure, would be gradually overcome. Meanwhile he had secured the attention of the world of the stage and cinema, and that meant that he was now breaking into a new sphere of activity where he had previously been almost unknown. In the theatre, too, there was none of the feeling that he was being over-advertised. This had been one of the great difficulties that he had encountered in his dealings with the B.B.C.

On one or two occasions Sydney Moseley went to the Coliseum, to get his own impression of the way in which the programme was coming over. He would make the opening announcement; then he would jump into a taxi in Long Acre, and arrive at the Coliseum. Once or twice, indeed, he showed himself on the stage when the television programme was over.

The great success of this early work at the Coliseum, however led to another bold venture. The B.B.C. had often broadcast sound commentaries on the great sporting events of the day, such as Test Matches, the Cup Final, Wimbledon tennis and the Derby. Why not, Baird asked himself, a television picture of the most exciting moments in some such event? Outside broadcasts, as they had come to be called, were comparatively easy for sound radio. A television outside broadcast was quite a different matter, and it presented many new puzzles, before it could be put into effect.

What Baird was really proposing to do was to show, on his large screen, something like the finish of the Derby. This meant putting cameras on Epsom Downs, and then passing on what these cameras picked up to the screen in a theatre or a cinema. It would mean that the audience would see the end of the world's most famous horse-race. They would see it,

too, just at the precise moment when it was happening. People in the theatre might even get the result of the race before it was known to some of those who were actually at Epsom.

It was a very exciting idea, and, as soon as it came into Baird's mind that this might be a success, he was setting to work on the details. After all, it was very different from what he had previously done. To put on a screen the face of a man in a studio was a matter of correct lighting. An outdoor event depended to some extent upon the weather. The lighting certainly could not be adjusted in any way at all.

To being with, it meant that Baird would have to get something like a portable studio. This he had built in a small van. It was completed in May, 1931. Inside the van there was a complete transmitter, designed to send back outside pictures to the theatre or to the B.B.C.

This set, too, was a little different from the early ones with which so much had been achieved. Baird had for long used a series of revolving discs, with holes in them. Now he adapted an invention of someone else, and used a drum containing a number of small mirrors. The drum was mounted on a spindle, so that it would revolve very rapidly. The mirrors then covered whatever was to be televised, and did it much more satisfactorily than the old arrangement of discs had been able to do.

Baird was sure that his arrangement to broadcast such an event as the Derby would work. The decision that had to be reached was whether this was to be done in a theatre like the Coliseum, or whether an attempt was to be made to interest the B.B.C. in the idea.

Baird and Moseley had many discussions about this. Hutchinson by this time had gradually withdrawn his interest in television, and was engaged in many business

enterprises of one sort and another. Baird was inclined to go out for a theatre with a big screen for the Derby. Moseley thought that, for the first time that a sporting event was to be shown on television, they should try to get the B.B.C. interested. There were still very few television sets in use. But most of the papers had one; and if they brought off a successful picture, the publicity would be terrific.

So a correspondence with the B.B.C. began. There was the old trouble about getting wave-lengths. International agreements restricted each country to the use of a certain number of wave-lengths. This meant that if Baird was to be granted a wave-length for a Derby picture, the B.B.C. would lose one of its own wave-lengths for that time. To begin with, the authorities at the B.B.C. were again very reluctant to allow this.

Moseley had been in touch with Gladstone Murray, the B.B.C. man who had shown so much sympathy with Baird and his ideas in the past. They did not dare to ask for much time—five or ten minutes at the most. The old transmissions which had been going on now at intervals for nearly two years, had usually been half an hour long. Sometimes, when the B.B.C. had some special programme, Baird and Moseley had been asked to give up this half-hour, and had agreed. Now, in return, they asked for a few minutes on Derby Day. It did not seem an altogether unreasonable request.

In the end it was agreed that this television should be allowed, though it would not have to be in any way in conflict with the sound commentary that the B.B.C. had already arranged to send out.

What Baird had thought it best to do was to have a camera by the winning-post, so that they would be able to send a picture of the horses, as they flashed past the post at the end of the race. This was agreed with the B.B.C., and on

Derby Day, which was Wednesday, June 3, 1931, the portable transmitter in its van, was duly taken to Epsom. The van was connected by telephone with the studio in Long Acre, where engineers stood by. From the London studio the signals were to be sent to the B.B.C. Station at Brookman's Park. This was the station from which many of the Baird transmissions had now been going for the best part of two years.

There had been some previous experiments, which had convinced Baird that the outside broadcast was quite likely to succeed. It was in a sense a bit of a gamble, for the publicity angle had not been neglected. As soon as the whole thing had been agreed with the B.B.C., all the papers had been told of the plan to televise the finish of the Derby. So it was quite sure that the sets installed in the various offices of the London newspapers would be switched on. If this failed, it would mean that Baird would be laughed at. But if it succeeded, it would be yet another triumph to his name.

In the event, the televised picture was not as good as had been hoped. More work, it was obvious, would be needed before successful outside broadcasts could be taken for granted. There was a good deal of flicker—much more than when pictures came from a studio. There was some interference, which caused the picture to be not as clear as it might have been. Yet the horses could be seen, passing the winning-post, which was really all that Baird had set out to do on this occasion.

The newspapers, as had been expected, had all watched the experiment with great interest. They reported on it without being as critical of the faults as might have been anticipated. Indeed, they more or less suggested that it was a marvellous advance in television that this outside picture could be transmitted well enough for the horses to be seen.

Baird was satisfied with it as a first effort in a new field. But he knew that a lot more work would be necessary before a really successful outside broadcast could be achieved. As soon as the portable station left Epsom and made its way back to London, therefore, he set down and tried to make up his mind what was to be done to ensure that he would not have to face a similar partial failure when next an opportunity to do an outside broadcast came along.

One journalist described this first televised Derby as a "stepping-stone to a new era," which was probably quite a fair comment on what had been achieved on this occasion.

The B.B.C. were convinced, too, and they made one of their studios available for Baird for future inside broadcasts—something that they had never previously done. It began to look as if he was now getting more firmly established. His company was not making much money—after all few people would pay a large sum of money for a set that would work only for about half an hour each day. But he was satisfied if he could do something as the weeks and months went by, to make television something more than an extremely expensive toy.

The next few months passed without anything very exciting happening. Baird still spent long and weary hours in the laboratories and workshops. He directed a small skilled staff now; they built television sets, which sold very slowly. But he was more concerned with developing matters, so that he might soon have more to offer those who might buy the sets.

It may be that he would have been wiser to separate his experimental work from the more dull routine tasks of making sets. Inventors are rarely good at routine tasks. Yet he needed to keep himself going financially; and if some of those who had invested money in his company saw small returns, that could not be helped. If the B.B.C. finally took up tele-

vision in earnest, he was sure that there would be enormous profits to be made. He more or less took it for granted that if the B.B.C. did secure the right to work the only television services in the country, they would use the Baird system. Certainly at this time in 1931 Baird appeared to be miles ahead of any other pioneer who was working on this side of the Atlantic.

He knew that there were some dangerous rivals in the United States; but at the same time he felt sure that he was producing better results than anyone else.

That First Derby in 1931 had been at best a partial success. He was resolved that when next Derby Day came along he would show the world that he had not been idle in the intervening twelve months.

In 1932 he had his way, and it was decided that, if they could get the co-operation of one of the big theatres or cinemas, that the Derby would be televised through the big-screen system, and shown to a large audience.

This time it was not the Coliseum that was used, but the Metropole Cinema, not far from Victoria Station. This was one of London's biggest cinemas, and would comfortably hold an audience of not far short of five thousand people. To show the Derby to an audience of that size would be of the greatest possible value to the cause of television, Baird thought, and Moseley readily agreed with what the inventor said.

This was a year when a famous actor, Tom Walls, owned a horse which had been entered for the great race. Tom Walls was a very popular figure with the sporting world, and many people were hoping that his horse would succeed in winning the race. In the event it did win. Five thousand people in the packed cinema saw the race, and were able to make out the identity of the horses entered.

Again, of course, the papers made big splash headlines out of Baird's triumph. Baird had left his assistant engineers in charge at Epsom, and was himself in the Metropole. He watched the picture on the big screen with growing excitement. The jockeys in such a race wear special shirts of various colours and designs; and, while colours could not, of course, be seen, the designs of the shirts were sufficiently distinct for the audience to be quite sure that the winner was the horse owned by Tom Walls.

The cinema resounded with cheers. Then someone shouted for Baird. This shout was taken up by more and more of the audience. Baird, always shy, was not sure how to acknowledge the applause.

Finally he came on the stage and bowed. There were more cheers and claps, and then silence. The audience were no doubt expecting him to make a speech, to tell them something about the development of television, and how proud he was to have seen this demonstration of its possibilities.

He was, however, terrified in the face of this great audience, and he merely bowed once or twice, and then made his way off the stage without having said a word.

Even though he was thus unable to say much, Baird felt the more. This had been an enormous improvement on the televising of the 1931 Derby race. There had been much less flicker, and the pictures had been altogether clearer than on the previous year. This was something which appeared destined to settle the future of television once and for all. This showed that it would be only a matter of time before many great events would be seen by millions of people, just as they occurred. It might be too much to say that at that moment Baird could foresee the occasion when a Coronation would be televised, or a Test Match, or the opening of Parliament.

But in his imagination he could see many such events that were then hidden in the more or less distant future.

His company was still not giving investors much return for their money. But those who had given him some financial backing could have had little doubt that sooner or later vast sums would come in.

Television was now on the map. It was only a matter of time when the fifty or sixty sets which were all that were in use would be multiplied a million-fold. This, too, he was quite sure about.

Baird might be a shy man, he might find it difficult to express in public what he thought in private; but all the same he was very sure of himself and what he was doing.

He still ate and drank and slept, almost as if in a trance. He still thought all the time of nothing but television and how it might be improved and extended.

The B.B.C., too, were for a time surprisingly co-operative about the whole affair. The authorities there had realized, after the second televised Derby, that this was something more than a toy. They had likewise come to see that while sound broadcasting might be established, that the time was not far off when television might even surpass sound broadcasting in popularity. So the B.B.C. became much more friendly towards Baird from that time on. In 1931 he had thought that things were not much better than they had been in 1929. But now, in 1932, there was a great difference. They thought at the B.B.C. that a screen with only thirty lines was not really good enough. It did not give a picture that was sufficiently clear. But they knew that this was something that would be very likely to improve as time went on. They knew, too, that Baird had much to offer, and they hoped that they would be able to use his system to build up regular

television broadcasts, and make television a nation-wide possibility.

This, of course, was all that Baird wanted. If the programmes could be made longer and more varied, there would be more and more attraction in owning a television set, and more and more of them would be sold. Then his company would at last find itself in the big money.

Broadcasting was a special task of its own. The B.B.C. had been given the sole right of sound broadcasting in Great Britain. It was not yet sure if it would, in the same way, be given a chance of doing all the television programmes. That did not depend on the B.B.C.: it depended on the Government. But meanwhile the B.B.C. went on preparing to move over into television in a big way.

The first step was to get a large-scale television transmitter of its own. Up to now the experimental transmissions had come through B.B.C. stations, but with Baird's own privately-owned transmitter. Now the B.B.C. asked Baird to make a big transmitting set, which they would buy from his company, and use for their own broadcasts, quite apart from any which he might be contemplating doing off his own bat.

This set, when made, was erected in one of the bigger B.B.C. studios at Broadcasting House.

On August 22, 1932, the first official B.B.C. television programme went on the air. Baird was very pleased when he was asked to appear in this first programme. He was introduced as a pioneer of the new invention. The B.B.C. made it quite clear that they regarded television as very much in its infancy, but they were at the same time well aware that it would sooner or later build up into something really big.

CHAPTER NINE

MORE TROUBLES

THESE days were partly happy and partly very unhappy for Baird. Now that he had put television well and truly in the public eye one would have thought the time an extremely happy one for him. But he was again running up against financial troubles. The development had cost a lot of money. And, though a good deal had been invested in the company, and though a certain number of television sets were being sold, this did not cover expenses by any means, and the cash in hand was gradually getting less and less.

It was not that Baird was in any way extravagant. He lived with great simplicity, and spent the absolute minimum on clothes and food. Very rarely did he dine at one of London's best restaurants; he did not go to the theatre. He was not married. His living expenses were small. The apparatus that had to be bought was what ran away with the money, and he did not really understand the way in which big business was organized on the Stock Exchange.

Moseley was able to help here. There were very complicated changes in the set-up of the company, and this staved off disaster for a time. Meanwhile Baird went on with his experiments. If only the B.B.C. would come out and say that they were to use the Baird system exclusively, then he would have been all right. But the Marconi company were also in the running. There was by this time not a great deal of difference between the ways in which the two companies

were producing television sets. The main difference was in the number of lines on the screen. But if the B.B.C. could not make up its mind which system it was to use, neither company could feel that it was able to go ahead.

The Marconi Company could, however, afford to play a waiting game longer than Baird was able to do, as they had greater resources in money. Moseley was for a time hard-put to keep things going, even with all his knowledge of Stock Exchange procedure, and all his ingenuity in manipulating shares. What they really wanted was to get a link-up with one of the great companies engaged in entertainment. If one of the cinema companies, for instance, would back Baird, they might get some sort of stable cash basis. The fact that his large-screen television had proved so successful made him think that there might be some chance of doing this. Indeed, this did happen in the end, though it was to be some time before he reached this position.

Another problem was that, owing to a great international slump in 1929-31, it was less easy to raise money to keep a company going than it would have been a few years earlier.

Baird used to sit at home worrying. He had done so much in the last few years. He had reached almost to the perfection of a television picture at which he had been aiming. Was he now to be defeated, when he was almost in sight of his goal? Sometimes he talked to Moseley and to others of his friends, and sounded utterly despondent and depressed. Yet he needed only to get back into his laboratory, with a mass of electrical apparatus in front of him, to lose all the despondency and depression, and to be back on top of the world again. Colour television, stereoscopic television—these still fascinated him. He did not seem to realize that it was really of little use doing anything like this until the original system

was adopted generally. Then he could go on bringing out something more elaborate.

Parliament had been discussing television, too. The problem for the politicians was whether the B.B.C. should be given the sole right of sending out television programmes. The B.B.C. had originally been the *British Broadcasting Company*, a private firm. But Parliament had decided, years before, that this was such an important matter that radio broadcasts should be taken out of private hands, and had turned the *British Broadcasting Company* into the *British Broadcasting Corporation*, under the general control of the Postmaster-General. The question now was if the same sort of thing should happen to television. Should it be handed over to the B.B.C.? Should a new television corporation be set up? Or should private companies be allowed into this field?

This was argued at great length in Parliament, but in the end it was decided that this new and important development could no more be left in private hands than the earlier sound broadcasting had been. The B.B.C. was therefore granted sole rights for television just as they had been earlier for sound radio.

The effect of this on Baird and his company was not necessarily harmful. He had, after all, produced a workable system of television. The B.B.C. had bought its transmitter from him. But always at the back of his mind there was the thought that the B.B.C. might change its mind, might switch over from Baird television to Marconi television, or to some other system which some other inventor might produce.

It was true enough that Baird had been the real pioneer. Yet he was not sure that the Marconi company or someone else might not produce something that would put his own

achievements in the shade. Where would he stand then? After all, if the B.B.C. was to be the only organization in Great Britain to operate television stations, it was vitally important to Baird that the B.B.C. should use his system of transmission and reception and not someone else's.

It was at this stage that Gaumont-British—then one of the main cinema companies—came into the picture. Mr. Isidore Ostrer, who was the head of the Gaumont-British Company, had been very much impressed by the big-screen television of Baird, and was gradually becoming convinced that here was one of the great advances of the future.

He paid a sum of several thousand pounds to maintain the Baird company in existence, even though for the time being he did not expect to have anything like control of the company. Moseley was meanwhile trying to raise more money elsewhere.

Baird was puzzled by all this. He knew that his job was to work on television, and he was totally unable to understand why he could not be left to get on with that job. Why on earth, he would ask, was there all this fuss about capital and bank overdrafts and deals in shares? This sort of thing was not his business. Couldn't Moseley and his other friends settle these details without bothering him about it?

Moseley was trying to buy some shares in the Baird company. These were in the hands of people who might, in order to try to get back some of the money which they had invested, get a court order entitling them to take over all the valuable apparatus that the company possessed. This would mean that the company would go bankrupt. Moseley knew that if he could only manage to buy these shares, the investors would get some of their money back, and the danger to the company's very existence would be over.

But in order to buy those shares, he needed to lay his hands on a big sum of money himself. Where could he get it?

Moseley was in New York at this time. In his own account of what went on, he comments that it is ironical that he was in America, trying to lay his hands on some thousands of pounds, in order to save *British* television! For there could be no doubt that if Baird's company went bankrupt the confidence of people in any kind of British television would have been sadly shaken. To most people, British television meant John Logie Baird.

It is impossible to make clear just what went on in those days. The cash arrangements were far too complicated for anyone who is not a financial expert really to understand what was happening, and how it was that the Baird company escaped the crash.

Eventually the saviour proved to be Gaumont-British, who had shown an earlier interest. So the Baird Company became part of the great Gaumont-British combine.

But before this happened Baird had an interesting experience. Moseley had told him of his own visit to the United States, and of the Americans' great enthusiasm for television. A small company called Baird Television Incorporated had been formed in New York, with the idea of helping to sell British television sets to the Americans. Moseley suggested to Baird that he should pay a short visit to America, where he could help to sell some of his sets and his ideas.

In spite of his usual shyness and his reluctance to meet a lot of strangers, Baird thought that this was a fine idea, and decided to cross the Atlantic at the first opportunity. In any event, it might help to secure American dollars for Great Britain. In those days after the great slump, dollar-earning firms were very popular with the British Government.

In New York Baird had a tremendous welcome. It was in

September, that he set off on the great ship, the *Aquitania*. On board he met one of his literary heroes, H. G. Wells, and was delighted to have a chance to talk to him.

On the quayside there were ranged a group of men in Highland dress, playing bagpipes. They were not Scottish, but this was the attempt to give a Scotsman a real welcome as he landed on American territory.

The idea was that Baird should walk at their head from the quayside to his hotel. His shyness overcame him, and he slipped away and caught a taxi. The pipers, however, knew where he was staying, and they soon turned up outside the hotel.

He was given the royal suite of rooms at the hotel. He described it afterwards as very impressive, "particularly the bathroom, an enormous hall having a vast black marble bath set in the floor with a great profusion of sprays and showers." He had never seen anything like this in his life, and he was almost terrified at the luxury.

He was given a police escort of motor cycles with sirens sounding, when he was taken to see the Mayor of New York, who was anxious to welcome him to the city. For the first time in his life, in fact, John Baird knew what it was to be famous. It was the way in which he was fêted wherever he went that almost scared him. His shyness was sometimes almost overpowering.

In America there were privately-owned broadcasting stations, and one of the companies bought the right to use Baird apparatus for television. This was a very good move, both by the American company and by Baird. It seemed to be a big enough step forward to justify Baird's expensive journey across the Atlantic.

Television was as new to America as it had been to Britain. The broadcasting firm which had secured the right to use

Baird's system had to go before a government committee to get permission. Baird went to Washington for the hearings before this committee. He was astonished at the way in which the legal arguments went on. After a little experience of such things in Britain, he was surprised at the informal way in which the hearings were held. No robed judges or barristers were to be seen. Everyone was dressed in ordinary lounge suits.

Lawyers and witnesses sat all together in a big hall, and chatted together in a friendly fashion. It was a totally new experience to Baird. A government commissioner, who had to decide if permission to use the Baird system was to be given sat back and his chair and gazed at the ceiling, apparently uninterested in the whole affair. Yet when he occasionally asked a question, it became clear that he was taking in all that was happening.

Permission was in the end granted, after Baird himself had given evidence and had explained how his system worked. He thought again that all was now plain sailing. However, another broadcasting organization objected on the ground that no foreign company should be allowed to have control of an American organization of this kind. There was therefore an appeal against the decision of the commissioner. This appeal was granted, and the whole thing fell to the ground. It was one of the greatest disappointments of Baird's whole career. If this had not happened, it might have been that Baird television would have swept the United States, and any decision in Britain would then have mattered very little.

The struggle between the various competing broadcasting organizations in the United States was to continue. But Baird knew in his heart that this was a battle that he had lost, and that he had from now on to compete with his rivals in Britain.

In 1931, while in New York, Baird had got married to Miss Margaret Cecilia Albu whom he had met in London three months before. This, he said, was a purely domestic matter. But some people criticized him, saying that he had gone to the United States on a business mission and that he was putting his own personal life ahead of his business interests. He got much publicity in the American papers, which portrayed him as the typical absent-minded inventor. But publicity was not much use in a country where even interested firms were not to be allowed to use his apparatus. And when Baird came back to London he was in many ways a very disappointed man, even though he was happy to bring his new wife with him.

He had, however, one thing to make him happy in the development of his business, and that was the fact that the great Gaumont-British film group were now backing him. This meant that if he got B.B.C. permission to make regular television broadcasts, there would be a host of well-known actors and actresses who would be available, for Gaumont-British had under contract many of the best artists in the entertainment industry.

The B.B.C. had been using both the Baird system and the Marconi system for their television programmes; this was not at all satisfactory, really, since the two systems used different numbers of lines. A television receiver would only be perfectly usable with one of these systems, which meant that any viewer who wished to see all the programmes that were being sent out had to have two sets to get good results. It was really too much to expect that many people would be keen enough to buy two very expensive receivers.

The time was fast approaching when the B.B.C. would have to make up its mind between the two systems of television. This, again, was discussed at some length in Parlia-

ment, and in the end it was decided to set up a committee, who were to study the various systems, watch the results that were obtained, and recommend which should be finally accepted by the B.B.C. as the system on which all future television would be based.

When once the Government had decided that the B.B.C. should be given sole rights in the television field, it was really only a matter of settling which system should be recommended. There was Baird; there was Marconi; and there was another system which was thought to be better than either of the others. This was a new scheme, based on the Marconi system which had been worked out by Electrical and Musical Industries, the great company which included many of the principal makes of gramophone records among its products, and which had fairly recently entered the radio market.

The committee included among its members a number of eminent men in various walks of life. Its vice-chairman, who was perhaps its most influential member, was Sir John Cadman (later Lord Cadman), who was a great scientist and also a great businessman in the world of oil. Formerly Professor of Oil Technology at Birmingham University, Sir John was now Chairman of the Anglo-Iranian Oil Company. He was made Vice-Chairman of the committee on television, and, being a man of great power and energy, at once threw himself into the task of settling the problem of television.

The main competition, the committee soon decided, was between Baird and Electrical and Musical Industries (commonly called E.M.I.).

They all knew that Baird was the real pioneer of television. But they were aware that it was at any rate possible that the later-developed system of E.M.I., based on Marconi, might be better than Baird's. The task of the committee was thus to weigh up the advantages and the disadvantages of the two

sets of apparatus. There was no bias. Members of the committee had not made up their minds in advance. They were quite prepared to do their duty and see what would be best for the future of television in Great Britain.

It was in 1935 that the committee settled down in earnest to study the problem. This was a very anxious time for John Baird, for he knew that the whole future of himself and his company would depend on the outcome of the committee's arguments. Sir John Cadman was told about the fact that Baird was tied-up with Gaumont-British. This, he was also told, meant that if the Baird system was adopted, there would be many great actors and actresses readily available. But the committee rightly decided that this would not influence their decision. The B.B.C. would in the end have the job of selecting actors and actresses for the programmes. It was seen that when this new entertainment medium came to be widely used, there was little doubt that all actors and actresses would want to appear on the television screen.

After all, if the face of an actor or actress was to be seen in, perhaps, millions of homes, this would be a great advantage to the person concerned.

So the crux of the whole matter really was the merit of the two systems. They did not differ enormously in their technical details—only in the number of lines on the screen, and on the way in which the sets could be worked. Would they be tunable as easily as a sound radio? Would the pictures be clear and easy to follow? These were the sort of questions which the members of the committee asked themselves. John Baird studied the faces of those who were looking at his set working, and tried to make out whether they were impressed or not.

The E.M.I.-Marconi demonstration took place in Baker

Street. The programmes came from the great factory at Hayes in Middlesex, where gramophone records were made in millions. This was thirteen or fourteen miles from the receiving set.

Baird's set was demonstrated at Film House in Wardour Street, which was the headquarters of Gaumont-British. A later demonstration was at the Crystal Palace, in South London, where Baird had taken a studio.

In one set of notes which was found in Sir John Cadman's papers after his death, years later, there were these words about Baird's set: "Reception was on the whole good; but a certain amount of interference showed itself in variations of quality, fading-out and in spots of light." It should be remembered that this was long before the habit of fitting what were called "suppressors" on car engines. If a car with a powerful engine passed near a television set flashes were apt to show up on the screen.

The E.M.I. demonstration did not at first impress the committee very well. The pictures had a greenish tinge. On the other hand, Baird's pictures seemed to have a brown colour. Neither system produced a clear and perfect black-and-white picture. The interference, due in the main to passing cars, caused a good deal of trouble with both sets.

At the Crystal Palace, Baird showed the committee his big-screen system. The screen for the ordinary demonstration was only some ten inches wide. Baird's big screen was some six feet wide. This was the system which had been used in his theatre television. But when viewed from a closer position than that in the theatre, a series of lines across the picture showed up strongly.

"Those lines are a bit obtrusive," Sir John Cadman said.

"That is due to the mirrors in the drum not being numerous enough," Baird explained nervously.

"You think that you will be able to get rid of it in time, then?" Sir John asked.

"Oh, yes. We are working on a different drum, with double the number of mirrors," Baird explained. "That will give much better detail in the picture, and it will get rid of the lines."

He wondered if he had made a mistake in showing his big-screen system. This, after all, would not be used by the B.B.C. But he had been unable to resist the opportunity to show off what he regarded as the finest invention that he had yet produced.

Sir John Cadman had been clearly impressed by this. But he told Baird that this was, in his opinion, more a glimpse of what might be possible in the future than a demonstration of what it would be possible to do in the present. With this assessment of the position Baird had to agree. Yet he was, as always, optimistic, and felt sure, in his own mind, that his big-screen system would be perfect in quite a short space of time.

He still did not know what the committee was really thinking. He was not at all sure how they felt about the respective merits of the new system of E.M.I. and his own older apparatus. He was quite satisfied with the way in which his pictures had come over, though he felt a slight nervousness when he recalled how his skilled assistants had stood by, turning knobs at intervals to ensure that the picture remained clear.

This, indeed, was what in the end influenced the committee. They found that both systems were faulty in some respects. The interference from car engines was the greatest fault of all. This, they knew, might be overcome in the end. But they thought that the trouble with Baird was that it seemed that the tuning was so delicate that it would need

constant attention, in order to keep the picture clear and steady.

The ordinary viewer, they considered, would not want to stand by his set, constantly turning knobs in order to maintain good reception. So in the end the Baird system was rejected.

This, indeed, was a cruel disappointment—the greatest in all Baird's life. He felt like committing suicide when he heard that his system had been turned down. He had been, after all, the first person in the world to produce a reasonably satisfactory television set—and now to see a rival system used by the B.B.C., at a time when television was to become a normal part of every home!

A good deal of the trouble had been the result of fire. When Baird had taken that studio at the Crystal Palace he had installed much expensive and complicated apparatus there. A disastrous fire had destroyed apparatus worth something like £100,000. To replace this in time for the committee's investigations had been difficult, and it may have been that this was really what tipped the balance against him.

Yet at this very time he was extending his big-screen system. There were a number of shows put on at the vast Dominion Theatre in Tottenham Court Road, with a screen that was twelve feet wide.

It may have been that he was, as on other occasions, trying to do too many things at the same time. If he had concentrated on small-screen transmissions for use in the home, he might have secured the right to put his apparatus into the B.B.C. studios. But it was not to be. John Baird sat back and wondered how to rebuild his shattered life.

CHAPTER TEN

TRAGEDY

BAIRD'S whole scheme of things had tumbled in ruins about his ears. The B.B.C. would not use his system. His contacts in the United States had proved useless. What could be done?

The Gaumont-British people thought at first that the only thing to do was to concentrate on making television sets. After all, if the E.M.I.-Marconi system was to be used by the B.B.C., it would be quite possible for Baird to make sets which would receive these broadcasts. This was true enough. Yet Baird felt very unhappy at doing anything of that sort. After having worked out the first really practical system of television in the world, it would be a come-down just to make sets that would receive another system, worked out by someone else. He did not like the idea at all.

He thought that the best thing that he could do for the time being was to concentrate on his large-screen type of television. The success of the Derby Day broadcasts showed that there was a possibility of getting the television of actual events on the cinema screen. Why not get a chain of cinemas fitted with television receivers? Why not replace the filmed news-reels of current events by television pictures, showing the events at the moment that they were taking place? Why not replace the short comedies and cartoons which were showing in most cinemas, between the big pictures, by

television entertainments, taking place in studios far from the cinemas themselves?

Baird talked this over with various friends, and with his wife. He was always inclined to develop great enthusiasms, and in a little while he had persuaded himself that this was where his future lay. This was something that E.M.I. could not do. The fact that he was part of the great Gaumont-British combine made it a very attractive proposition, for Gaumont-British controlled many cinemas, often including the biggest ones in some of the large towns and cities.

Baird tried to put these ideas before the Board of Directors of the company. They were, unfortunately, not impressed. As usual, Baird was not good at handling such matters of pure business. However, the large-screen equipment was already installed at the Dominion Theatre in Tottenham Court Road, and some broadcasts took place there.

Meanwhile Baird went on pushing his ideas and urging the building up of a system, later to be called "closed-circuit" television, sending programmes to theatres and cinemas, and ignoring the B.B.C. broadcasts to people's homes.

In the end he managed to persuade Mr. Ostrer, the head of Gaumont-British, that this was the only possible future for the company. Mr. Ostrer had been deeply disappointed at the failure to persuade the committee to adopt Baird's system, and he was in the end fired by Baird's enthusiasm for big-screen television.

Mr. Ostrer suggested that the company should be reconstituted under a different name, since its aims and objects were now so different. Baird met him at a television exhibition which was being put on at the Science Museum at South Kensington. Baird's original set was one of those being shown there. "I was full of enthusiasm for cinema television,"

Baird wrote after this meeting, "and I let him have it in full force."

In any event, he managed to infect Ostrer with his enthusiasm, and soon they were working out the way in which the new company should be formed. There was only one immediate disappointment for Baird. The new firm was to be called Cinema Television Ltd. It was to take over the various patents that Baird had filed during the years. Baird wanted his name to be somehow put into the name of the company, but Ostrer was insistent. After all, the name should suggest what was the job that the firm was setting out to do. They might also find that, in addition to Baird's big-screen system, they would use other systems too. The name should therefore be such as to give them a chance to develop in whatever way seemed best.

Baird was rather suspicious about this. He was quite wrong in feeling that this was a possible attempt to get him out of the way. Ostrer admired his inventive genius enormously; but he was a businessman, and he was aware that, since the B.B.C. were not going to use Baird's system, his name would not be as attractive as it would have been a few years earlier.

He did not, of course, mention this to John Baird. He insisted that the name should be Cinema Television, and to this Baird was forced to agree. After all, it was Ostrer who was to provide the money backing for the scheme, and, even though most of the inventive work was Baird's, it was impossible to fight against the financiers.

Moseley was to come on the board of the new company, and it was suggested that Baird should be its President at a large salary. Once again it looked as if Baird was to find himself in a happy position.

He had at this time a house at Sydenham, in South London,

and he had fitted up a room as a small individual laboratory, where he could work in peace at his inventions, without being bothered by any of the lesser worries that gave him so much trouble elsewhere.

It was in this laboratory at Sydenham that he improved the efficiency of his big screen; he demonstrated this to Ostrer, and the film chief was delighted with the results. The picture was clearer than any which they had so far secured, and there was little if any of the flickering which had previously caused so much disappointment.

This had occupied a year or two. Time went by, and Baird was scarcely conscious how slow in getting results he appeared to be. Some members of the Board of Directors were critical of him. He even suggested that there was an anti-Baird faction on the Board.

Yet he did not allow this to disturb him unduly. He knew that many of the biggest Gaumont-British cinemas were being fitted with television equipment. Before long, he told his wife, the pictures that went out from a studio owned by Cinema Television Ltd. would be shown all over the British Isles. It was a wonderful prospect.

The making and selling of television sets for use in the home went on too, as a minor part of the company's activities. Baird had little to do with this. He had designed the sets; but other people had the task of building them to his design. The sale of these sets helped to bring some money into the company; but Baird was very unhappy to be responsible for making television sets which were not designed to use his system of reception.

On the other side of the company's activities, however, things were very different. Here he himself was responsible for the design, and for a good deal of the construction. He could foresee the day when every cinema in the country

would have a Baird receiver, and when great national and sporting events would be flashed on to a huge screen as they took place. People, he told himself, would flock into the cinemas to see the Derby and the final of the Football Cup. Why not?

What he did not foresee was that the B.B.C. would put such events on the small screens in people's homes. If anyone could watch the Cup Final by the fireside in the home, the huge crowds would not be likely to flock to the cinemas and the theatres to see the same thing there.

Perhaps it was as well that Baird could not see into the future. He could not foresee, either, the way in which world events were to stop the development of television for years.

In those days of 1938 and 1939 Baird was so tied up with his work in improving large-screen television that he did not bother to read the general news in the papers. This news became more and more menacing as time went on.

In Germany Hitler had come to power, and Hitler seemed set on a course that in the end would lead to war. Baird had been unhappy enough in the years from 1914 to 1918. But then he had not the overwhelming urge which his work on television had now given him. He did not think that there would be war now. Indeed, he scarcely gave such international events a thought. He certainly did not see that a great war, if it came, would lead to a suspension of television altogether, though the government had quite soon realized that if war came, any continuance of the B.B.C.'s now increasing television programmes would be quite impossible.

Everyone knew that if war in Europe came, there would be heavy air-raids. Those who understood something of the way in which modern aeroplanes were flown knew that a television picture, coming from a transmitter at a known

spot, would be of value to enemy aircraft approaching Britain.

If an aeroplane set out from Germany towards the East Coast of Britain, it would be aiming for a particular place where it could drop its bombs. If there was a beam of electric waves (which was what a television picture really amounted to), that beam would give the raiding aircraft an exact indication of direction. This was just what Britain could not afford to do. So the government, while nothing was publicly said about the matter, had come to a decision which was to be a tragic affair for all who were concerned in television.

They had decided that from the moment when war broke out, all television would at once stop.

There was a big radio and television show in August, 1939. The Baird sets (though they were sets to take the E.M.I. pictures) were shown there, and the show was on the whole very successful. Baird went and had a look at the stand. The sets looked very much more of a finished article than the primitive things on which he had been working so hard only a few short years before. The public flocked to the exhibition, and a considerable number of the latest Baird sets were sold. Again it began to look as if this side of the company's business was booming.

The other side, too, was proving reasonably successful, as more and more of the cinemas under the control of Gaumont-British were fitted up with the equipment necessary to receive the televised pictures.

Baird had had one of his influenzal spells not long before. But he had made a quicker recovery than usual. His wife had nursed him through the worst time, and he was beginning to feel happier than he had done for some time. The great blow when the B.B.C. had not been allowed to take on his system was now in the past, and the way in which the business was

building up gave him real cause for hope in the days ahead.

All his life, however, Baird seems to have been dogged by ill-luck. Sometimes it was illness that troubled him. Sometimes, as now, it was some events over which he had no possible control that upset some cherished scheme, and stopped the development which might have made his fortune.

When the government announced, at the outbreak of war, that all the B.B.C. television programmes would be suspended, Baird could scarcely believe it. That this great new medium of education and entertainment should stop suddenly seemed to him the final blow to all his hopes. He went home to Sydenham almost in despair. It was only the encouragement of his wife that kept him going in those first few difficult days that began in September, 1939.

Yet still it was the idea of television and its future that really filled his mind. He knew that he would not be able to do anything in the way of broadcasts, either to people's homes or to the cinemas. Yet he would be able to continue with his experiments, in his own little private laboratory at home. Sometime this war would end, and the normal activities of peacetime would begin again. His task for the moment was to prepare for that.

It was ironical that this should happen at this moment. For Baird television receivers were the best on the market. The factory where they were being built now employed some five hundred men. All those men had to be stopped from their work.

Mr. Ostrer, too, decided that the big-screen work would have to stop. No one knew just what was going to happen, now that war had broken out. Everyone expected large-scale air raids straight away. Cinemas and theatres closed un-

til further notice, because it was thought that if a bomb hit a place of entertainment where there were assembled a large number of people, the casualties would be very heavy.

Shops continued to open, of course, for people still needed to buy food and clothing. But cinemas were a luxury. Television was a prospective danger, in that it might serve to guide the Nazi air force. So everything for which Baird had worked over the years seemed to fall in ruins overnight.

By this time, too, Baird had two small children, so that he had the additional worry of wondering what to do about their safety. Living in South London, he was in a district which was regarded as really dangerous. He did not want his wife and children to be exposed to the danger of German bombs. So he made arrangements for them to be taken to a safer place.

Soon after war broke out, indeed, he took them to the delightful little holiday resort of Bude in North Cornwall; then he came back to London himself. Even though it was dangerous, he knew that he would not be happy away from his laboratory. He also had hopes of doing something, perhaps, which would be of value in helping the country's war effort.

His health, though not quite as bad as it had so often been in the past, still made it certain that he would not be acceptable for service in the forces. But he hoped that he might perhaps, with his scientific and engineering knowledge, be able to play some part in the background work which he was sure would go on.

Every aircraft that flew for Britain would need a wireless set. Probably even tanks and army vehicles would be also equipped in the same way. He had heard vague rumours of what was eventually to be called "radar"—a kind of

magic eye which was being developed by Robert Watson-Watt,* another Scot whose home was not far from Baird's own.

Surely, he told himself, there would be a place for him in all this new development that the war would surely bring in its train.

He wrote to government departments, he worried some of his friends who had managed to secure posts in one or other of the ministries. There was a Ministry of Supply, which had been set up to organize things for the armed forces. This Ministry was in charge of almost everything, from uniforms to ammunition, which the fighting men would need.

But Baird was not able to secure a position in any of these departments to which he wrote. It might be that they felt an inventor was not quite the right kind of person to undertake the rather dull routine work which all such departments have to do. It may even be that they were right in so deciding. It is difficult to imagine John Logie Baird sitting at a desk in Whitehall, working out quantities of shell components, or going to a factory to try to boost the supplies of some vital weapon. Yet he was prepared, he said, to undertake anything which would be of value and importance to the war effort of the country.

Just what he was to do he could not decide. He saw friends doing all sorts of jobs. Some of them were interesting; some of them were just dull. But they were all helping Britain to fight for her existence in a terrible war. And he had just to sit back, it seemed, and do nothing at all!

His old friend Sydney Moseley was given the task of helping to run the British information service in America. The United States was as yet neutral in the war. Clearly,

* See *The Radar Man: The Story of Sir Robert Watson-Watt*, by John Rowland.

however, the American President and his government were very sympathetic to Great Britain. It was considered needful to let the American government and the American public know something of the British point of view, and some skilled journalists were given the task of organizing a special service in America, through the papers and the radio networks, to let America know how Britain was standing up to the ordeals that the war was bringing.

Baird felt that he was being deserted by everyone. He was not wanted in any government department, as far as he knew. His friends were being scattered far and wide. His family was hundreds of miles away in Cornwall. And—perhaps most serious of all—he looked like soon being in difficulties regarding money.

He had never been a man who saved money. When he earned a lot he spent it. It was not spent on silly luxuries. It was spent in the main on the expensive apparatus he needed for his many experiments. For it was only by going on with these that he managed to keep his head.

Probably he could always have charged the expenses of these experiments to the company. But—never very business-like—he often went out and bought something out of his own pocket, not wanting to go through all the complicated procedure of persuading the directors to allow him to spend money on what was not obviously necessary for future work.

One story which is perhaps typical of him at this period is that he stayed for a day or two when war broke out with some friends outside London. They had persuaded him to leave the danger zone at Sydenham and come to live with them until it became more clear if heavy air-raids were to be expected.

After he had been there for a few hours, he suddenly said: "I must go back to Sydenham."

"Why?" asked his friend.

"There's a very valuable piece of apparatus there. I must get it, and bring it here in safety."

"Very well," his friend answered. "I'll drive you up there, you can collect it, and we'll come back."

Baird agreed. His friend got the car out of the garage, and they drove off. Baird was very silent on the journey, and his friend wondered what this valuable piece of apparatus could be. Was it something to do with the experiments on colour television about which John Baird had been speaking? Or was it something, perhaps, with some gold or platinum or some other valuable metal in it?

In the end they arrived at the house. His friend pulled up by the front door.

"Wait here. I shan't be more than a minute or two," Baird said. Then he made his way into the house.

He was true to his word. In less than five minutes he came back to the car. What he was carrying with him was not some massive and valuable piece of apparatus. It was a small kitten!

CHAPTER ELEVEN

GRINDING TO A HALT

IN spite of the fact that the greatest war in the history of the world was now being fought, Baird took little interest in the day-to-day news. The country, he thought, did not seem to need his help, and therefore he did his best to ignore what was going on. When London was bombed, he tried to ignore that too. There were occasions when a bomb fell rather dangerously near his Sydenham home. Then he would dive under the table, to avoid possible splinters of broken glass from windows. When the immediate danger seemed to have passed, he would climb out again and get on with the work of the moment, as if nothing had happened.

He managed, too, to ignore the financial problems which now began to crowd in on him. He was still working at his proposed colour-television scheme. The factory had ceased producing sets, the company was in effect at a halt. He retained the services of one or two assistants, and paid them out of his own pocket. But that pocket had its limitations! If he wondered what he was going to do when the supply of cash dried up, he said little to anybody about it. Yet he had the expense of keeping things going in London, and of paying the expense, too, of maintaining his wife and his two children at Bude.

The house at Sydenham was badly damaged by bombs at one time. But it was somehow patched up, and Baird went on with his experiments in the undamaged part of the house.

He seemed determined to prove that he could still spend all his time and all his energy on television, even though the world did not appear to be very interested in it.

It was in October, 1940, when the war had been going on for slightly over a year, that Baird took out a patent for a system of colour television which he now thought was workable. He had worked out a system of sorts, years before; but now he had something far better than he had previously thought to be possible. As soon as the war was over, he told himself, this would be put on the market, and his fortune would be made! He did not realize that it was the old story all over again. He was enthusiastic about something, but in order that the enthusiasm should be translated into practical results, he needed the help of some more practical men. No matter how perfect a system of colour television might be, it would not be used unless the backing of an organization like the B.B.C. could be secured. And Baird's former experience with the B.B.C., after all, had not been very encouraging.

The war, too, brought him more bouts of illness. The colds and influenza which had haunted him at intervals ever since his childhood came back from time to time. These, too, he tried to shrug off, as of no importance. But every now and then he had to spend a few days in bed.

In 1941, with the war at its peak, and the cities of Britain being bombed, night after night, Baird sent out invitations to the London papers, asking them to send reporters to witness a demonstration of his new system of colour television. The image could not, of course, be sent out over the air. It could only be sent within the confines of his laboratory. The results much impressed most of those who saw the demonstration. Yet little appeared about this in the papers.

Baird's ill-luck seemed still to be pursuing him. The war

news filled the papers, and war news was what most people wanted to read. Moreover, there was a severe shortage of paper on which to print the news, and the daily papers were getting smaller and smaller. This meant that there was very little space to spare, in order to deal with everything that happened. So all that Baird got was a small paragraph, whereas in normal times the story of colour television would have been reported at great length, under sensational headlines.

The Baird company had been more or less wound up. An official receiver was put in charge. His job was really to see if there were any valuable assets remaining. No more television sets could be made, since television was in suspense. Baird himself resigned from his position as one of the directors of the company, as there seemed no point in continuing there, when in effect the company was doing nothing. Yet as a director he had received some salary. That salary now stopped.

Baird wrote to Moseley, now installed in New York, saying that he was still carrying on with his work, and was paying three research assistants. "I have still got faith in my work," he wrote. But faith in his work was not enough to pay the salaries of his assistants.

Moseley, in spite of the fact that he was broadcasting, often several times a day, over the American radio networks, thought that he might be able to find time to interest some American firms in the possibility of television developments. He even thought that if he could get Baird over to the United States again, there would be a chance of his friend getting a post with one of the American television companies. This would have given him an opportunity of going on with his development of colour television. It would also have given him greater safety for himself and for his wife and family.

Yet Baird could not bring himself to take this step. He knew of many people who had found safety across the Atlantic. But such a solution, he thought, was not for him.

The dangers that were waiting for him in England were not only the dangers of the Nazi bombs, either.

On one occasion he visited his wife and children at Bude. His mind was, as always, on television and its problems. He was sitting on the beach at the Cornish seaside town. He had broken his glasses, and had stuck them together with adhesive tape. He wore old clothes and beach shoes. In his hand was a tattered notebook, in which he was scribbling diagrams and calculations for a new type of television transmitter which had somehow come into his mind at that moment.

Someone had seen this odd-looking individual, and had thought that he seemed to be a very suspicious character. The police were told that a man was acting very queerly on the beach, and a policeman came down to see what was happening. At this time people were often inclined to think that the Germans had spies everywhere, trying to ferret out the secrets of Britain's defence system. Bude did not seem a very likely place for a spy. But any seaside town might be the sort of place where spies would, perhaps, get off messages to an enemy submarine.

So the policeman came up to Baird. "Can I see that notebook, sir?" he asked quite politely.

"Notebook?" Baird had been deep in thought, and the question hardly registered with him.

"Yes, if you don't mind, sir." The policeman held out his hand, and Baird obediently handed over the notebook as requested. He had not the slightest idea what this was all about.

All sorts of questions followed. Baird was quite indignant

when he realized that he was being suspected of being a German spy. He thought, however, that he had convinced them that he was a quite harmless engineering inventor, and that the notebook merely contained the preliminary plans for a new kind of television set which he hoped to get on the market at the end of the war.

But Mrs. Baird, who had been getting a meal ready at home, now arrived with the little car which she used. Baird got into it solemnly, and glared at the policeman who had been questioning him. Mrs. Baird noticed, however, that the policeman looked at the number-plate of the car, and jotted the number down before they drove off. Baird had been especially angry in that when he had told the policeman "I am John Logie Baird," his name did not mean anything to the constable.

There were, however, still various possibilities in the United States where his name meant much. Several times he was asked to go there. But he still could not make up his mind. "I must hold on," he wrote in one letter to Moseley. This appears to have been his reaction to any suggestions about a change that might come his way.

Again a bomb damaged the house at Sydenham. Some of the valuable apparatus was smashed. The living quarters became impossible. Baird set to work to patch up the apparatus as best he could, buying spare parts where the old parts were impossible to mend. He went to live in a little private hotel. He snatched a few days at Bude whenever he could. But all the same he felt too restless to settle down anywhere for long.

It is difficult to imagine any life more frustrating than that which Baird was now living. He had at his finger-tips many important developments. His colour-television system was now almost perfect, he thought. He was also working out a

better large-screen system. He would use this, he told himself, to show in the cinemas the victory parade which would no doubt march through London when the war was over.

All these wonderful ideas in his head—and yet no chance of putting them into operation! No wonder that sometimes he felt utterly depressed. He was, as always, quite confident of the eventual outcome of his work. But how was he to get through this terrible period of waiting? That was his main problem in those years of war. He could see his bank-balance steadily shrinking, too, with little likelihood of being able to build it up again until television restarted—which is to say, when the war was over.

He wrote to Moseley in the United States of what he was doing. He had now designed a set for the home which would have a screen two feet six inches square. As he said, this was the largest screen ever designed for a set to be used in the home, as distinct from those which were to be used in cinemas and theatres.

He described this as the de luxe super-screen television, and added that it would have push-buttons. These would enable the owner to have at will an all-wave radio set, an automatic-change gramophone, the B.B.C. television programme, the Baird colour television programme, and the Baird stereoscopic television programme. "This set," he wrote, "has been built and demonstrated." One is a little doubtful whether Baird was not claiming a little too much and being over-optimistic especially in his idea of stereoscopic television, which was still very much in the early development stage.

Yet the fact that he was thinking along these lines, in those days when all television broadcasting had been suspended, shows that he was content, not merely to hold on, but to

work out the most elaborate plans, and to put them into operation.

He asked Moseley if it would not be possible to get some American financial backing for this new super-set. Baird always had a touching confidence in the way in which financiers would be prepared to put up money for a really grand scheme of any sort. If he had been in America, with one of his super-sets in working order, this idea of cash backing might perhaps have come off. But men with a lot of money will not, as a rule, be prepared to invest it in a scheme on paper, unless they can see a really convincing practical demonstration. No doubt Baird could have provided such a demonstration; but he could not do it from 2000 miles away and more.

By this time Baird had become almost a hermit. His money was shrinking more and more. He had to dispense with one of his assistants, and now had only two men working with him. He could afford nothing which was not vitally necessary. Even his visits to his wife and family at Bude had to be strictly rationed, for railway fares were high. Yet somehow he carried on. Sometimes he got pictures in colour which were better than any he had previously been able to get. He fluctuated between wild optimism and dismal pessimism. And still the war dragged on. He knew that he could really do nothing until the fighting was over. Even then, he sometimes asked himself, how long would it be before television started up again? Would there be long delay? For the time was coming when he would not be able to wait. He would have no money left. And what was he to do then?

His new big-screen gave him great joy. The pictures he was now getting were far brighter and clearer than any he had previously been able to show on a large screen. Either in the home, or in the theatre, or both, he knew in his heart that

there was a chance of a really spectacular success, if he was only to have a chance of exploiting it.

In May, 1941, he had one minor success in keeping his name before the public. The *Radio Times* printed a note about the possibility of colour television, in which it said that Mr. Baird had shown them a new system, using six hundred lines. This was much more than had ever before been used. The colour picture, on a screen two feet six inches by two feet, was, the *Radio Times* added, of a surprisingly high standard. The official paper of the B.B.C., indeed, said that it was thrilling to see these highly successful results.

Gleefully Baird cut out the note, and sent it off post-haste to Sydney Moseley in America. He wondered, he added, if it would be possible to get together a group of American businessmen who would put up some money to get this new system working.

Time after time, in the letters he wrote during the war years, there came that thought that all that was necessary was to find some businessmen with money, and then all would be well. This may, indeed, have been true enough. If Baird had been prepared to go to the United States, taking one of his super-sets with him, he might have been able to convince them.

Once, in fact, he wrote to Moseley to the effect that he was thinking of starting a television station in California, where he could work in peace and get away from the rigours of the English winter. But he never made the final decision to quit England. Perhaps at that time he had not enough money to take himself and his wife and family across the Atlantic; perhaps he was not able to make up his mind to uproot himself in this way.

Whatever the reason, he stayed in England, wandering about from one cheap hotel to another, and still going for

hours every day to the bomb-damaged house in Sydenham where his precious apparatus was still working.

There was one occasion when Sydney Moseley was on a brief visit to London. He had been asked to come and see some officials of the wartime Ministry of Information about the work that he was doing in the United States. He managed to snatch an hour or two to see Baird, who was living in an inexpensive little hotel in South London.

He found his old friend looking much older, with his hair now grey and his face lined with wrinkles. Baird had, of course, had many worries to face, and he was still extremely worried about his financial position. He was getting more and more hard-up; but he was still employing two assistants. They cost him £12 a week, between them. It was money which he could ill spare. Yet he had to go on with his development work, and it was more work than he could manage to do by himself.

Soon after Moseley's return to America the war in Europe ended. Then, with the dropping of the first atom bombs on Japan, the other half of the war came to an end.

Would this be John Baird's great opportunity?

He waited, day by day, for the announcement that television was to re-start. That was all that he wanted. He was longing to get going again on his chosen path. He had, in the winter of 1945, suffered from another of the dreadful colds that had dogged him all his days. But even when he was feeling wretched, lying in bed, he scanned the papers and the *Radio Times* to see if there was some prospect of getting television programmes started again. Then his super-set would come into its own, and all would be well.

Soon he was up and about again, studying the sad story told by his latest bank statement. His money was nearly exhausted. Yet he was sure that if he could only hang on for

another few weeks, or months at most, the demand for his new sets would arise, and he would be earning more money than ever before—more money even than in the days when his life had been insured for as much as £150,000!

Finally the announcement that he had been waiting for came. The B.B.C., as he had anticipated in the worst days of the war, were to re-start their television service with a series of pictures of the great victory parade which was to march through the streets of London in June, 1946. This was the chance that Baird had been waiting for.

His super-set would receive B.B.C. programmes. It would show them with greater brightness and clarity, and on a bigger screen than any other set that was available.

Hastily he went to the set and carried out some routine tests. It was perfect. He drew up a letter which was sent to all the papers. They were invited to send reporters to see the super-set in action, to see a better picture of the victory parade than any other viewers in the country. This was a brilliant piece of publicity work, for it meant that the magic name of Baird would once again be featuring in all the daily papers. For six long years he had hung on grimly, waiting for this day to arrive.

Yet when it arrived he was not there. Another of his frightful colds had struck him down, and he had to stay in bed. His assistants showed the set to the journalists. It was highly successful. It seemed probable that a new Baird television company could soon be launched and the inventor's ambition at last be achieved.

But it was not to be. Baird had thought that he was suffering from one of his usual colds, and felt annoyed that it should come at such an inconvenient moment and had thought that he would soon be up and about again. It was, however, more than a cold. It was pneumonia. Within a

week of that triumphant demonstration of his set, John Logie Baird was dead. He was fifty-eight years old.

His wife, who had looked after him so well over difficult days, accepted her loss with great courage. She knew that her husband had been a genius of his kind. She knew that she had a difficult future to face. But her first task was to see her husband laid to rest where he would have wished. She would not allow his body to be buried in England. She arranged a funeral at Helensburgh, where he had been born. In the little graveyard there John Logie Baird came home.

His story is very different from that of many great inventors. It may not be thought anything like what is sometimes called a "success story." It may, in fact, be thought almost a story of failure. John Baird had great courage and great ability. But he never had the stroke of luck which comes the way of most successful inventors. Ill luck and ill health dogged him all his days. When he died he might well have been on the verge of his greatest possible success. There are still made and sold television sets which have his name on them.

Yet it is not only those sets which derive from his work. If John Logie Baird had not lived, television would probably have come into existence sooner or later. It might well have been a good deal later. More than anyone else in this field of invention, Baird will be remembered. If he failed in a financial sense, he was a great success in that he placed his name on the list of famous men. Whenever a television programme is seen, those seeing it will owe much of what they see to the inventive genius of John Logie Baird.

AUTHOR'S NOTE

Readers who wish to know more about the development of television may be advised to read any one of a number of excellent books on the subject which are now available. Perhaps the best for a beginner in the subject is *Television Works Like This*, by Egon Larsen (Phoenix House).

It is strange that, in spite of his pioneering efforts, so little has been written of John Logie Baird. The best book about him which has yet appeared is Sydney Moseley's *John Baird: The Romance and Tragedy of the Pioneer of Television* (Odhams Press; 1952). Mr. Moseley was a friend of Baird for many years, and was able to quote extensively from some unpublished reminiscences which Baird had written.

The one part of Baird's life which was not dealt with in any detail by Mr. Moseley was the period of tragedy, when the B.B.C. did not adopt his system of television. Here (especially in the meetings of the Committee considering the matter) more detail is given in *Ambassador for Oil* (Herbert Jenkins), the life of the first Lord Cadman, by the second Lord Cadman and John Rowland. Finally, if anyone wishes to get an impression of the achievement of Baird, as compared with those of other inventors, this may be derived from *Epics of Invention*, by John Rowland (Bodley Head).

Most of the books mentioned are out of print; but it should be possible to find copies in any good library.



